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1. Papers that contain original thinking in education or educational research.
2. Papers that make a significant contribution towards developing a theory.
3. Papers that summarize and discuss an outstanding study or a piece of educational research.
4. Papers that review significant research in important areas.
5. Letters to the Editor on important research problems.

The emphasis is on categories 2, 3, 4 and 5. Ordinarily, a paper is not accepted if it has appeared in print or in any form elsewhere. Exceptions may be made for contributions which the Editor considers should be

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Some Conceptual Variations in Examination Reform

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CLARITY OF CONCEPTS is a must for the success of any endeavour. This checks misdirections and consequent waste of energy and time. It also strengthens the potential of the inputs through the adoption of a unanimous approach by workers in the field and thereby makes for realization of goals.

It is this clarity that is often lacking in education, and this is responsible for many debacles in the field. Furthermore, academicians are very good at flirting with new ideas and concepts. Very often, futile exercises pass off as signs of progress and academic freedom.

While experimentation deserves all support and academic freedom should continue to flourish, investments in new ventures need serious deliberation, particularly because our resources are scarce.

Like all educational endeavours, examination reform has also, of late, suffered from the infiltration of some conceptual confusions. Some of these have originated from an unseemly enthusiasm to use some fashionable concepts of foreign origin without due analysis and study. Some others are an outcome of following the path of least resistance, in selecting for implementation projects which are administratively the easiest. They

are also often introduced without adequate preparatory steps. Besides, there are others which have germinated from ignorance.

It is desirable that these confusions are identified and discussed as it will be in the interest of sound examination reform. An attempt is therefore made here to analyze these conceptual differences.

Objective-based and Objective-type Questions

Very often these terms are used synonymously. Objective-type questions are those that can be scored objectively. Thus the true-false, sentence completion, matching, master matching and multiple choice questions are all objective-type questions. In fact, the term 'objective type' basically relates to the form of a particular question. A question could have an essay form, a short answer form, a very short answer form or an objective form.

On the other hand, the term 'objective-based questions' is meant to connote those questions which are aimed at testing some predetermined objectives of teaching (abilities or skills). For example, a question, irrespective of form, may test just recall of information, while another may require the student to identify relationships and a third may demand the making of a prediction in an unfamiliar situation. The first question in technical terminology will be called a question testing 'knowledge', the second will be designated as an 'understanding' question and the third an 'application' question. All these—knowledge, understanding and application—are objectives of instruction and questions especially designed for testing these different levels of objectives (abilities) are called 'objective-based questions'.

Thus, all objective-type questions are objective-based questions as they would be testing some objective or the other; but all objective-based questions need not necessarily be objective-type questions. They could be essay type or short answer type questions, or very short answer type or even objective-type questions.

Short Note and Short Answer Questions

The short note questions have been there in the question papers of our traditional examinations. These questions were incorporated in the question papers primarily for the purpose of attempting a wider coverage of the syllabus. But this coverage was not quite effective. More often

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than not, the short note questions just gave the broad themes for writing short notes. For example, it was not uncommon to find such themes as 'democracy', 'the second World War', and 'socialism' in the question papers. An examinee did not know how short or long the short note had to be. In fact these themes could not often be differentiated from the main questions carrying four or five times their weightage.

A short answer question, on the other hand, is one which requires just a short answer. The examinee cannot, without harming his own interest, write a long answer to such a question. They are, therefore, specific in their purport and unambiguous in their wording. For example, a question of this type will not require a student to give an unbridled comment on the Constitution of India, but may call for the identification of one or two of the provisions of our Constitution which, till the 44th Amendment was carried out, positively hindered the implementation of the measures of economic reform and reconstruction introduced by the Government from time to time.

Thus the short answer questions are structured questions while the short note ones of the traditional question papers are not essentially so. This characteristic also gives an edge to short answer questions over the short note ones, as it is easier in the case of the former to decide about a definite outline of the expected answer, which in turn ensures greater objectivity in scoring. Also, while the short note questions mainly test information, the short answer questions can be designed for testing a variety of objectives.

Internal Assessment

The term 'internal assessment' is also being interpreted in a variety of ways in spite of the clear definition given by the Report on Education and National Development (1966).

For a clear appreciation of the concept of internal assessment and its application, it appears necessary to go into a bit of history. In this regard we can recall that while the idea was in the air for quite some time, a formal recommendation about it came for the first time through a resolution of the famous Bhopal Seminar on Examinations (1956). This suggestion was widely welcomed and very soon internal assessment was introduced in Bihar, Madhya Pradesh, Punjab and Vidarbha. In all the four States, varying percentages of marks out of the total marks allotted to each subject were allocated for the purpose of internal assessment. The teachers awarded marks to the students out of the allocation for internal

assessment. These marks were forwarded to the respective boards and were added to the marks obtained by the student in external examinations, for calculating the final score. The aggregate total of these marks determined the division a student secured.

No sooner was this practice introduced than it started being misused by schools for boosting the results of their students. The malpractice was detected quickly, with the result that each State withdrew the measure without delay.

This was a great setback to the innovation of internal assessment. Because of a few unscrupulous individuals, the reputation of the teaching community was tarnished. Since then the term came to disrepute and started being looked upon with suspicion.

Educationists, however, did not lose heart and did not give in to the criticism of the administrators. They initiated several experiments in internal assessment and laudably succeeded in one. This was initiated by the Rajasthan Board of Secondary Education, Ajmer with the academic help of the Central Examination Unit of the NCERT. After a three-year successful trial, this scheme was introduced in all the secondary schools of Rajasthan in 1969. It is also being currently tried out in 500 and odd schools of Tamil Nadu, where it is almost at the take-off stage for being introduced in all the schools of the State.

This scheme is based on the presumption that internal assessment is capable of covering a wider range of pupil growth than external examinations and that it should be put to such use. A natural corollary of this presumption is that, as the aspects of personality assessed by both are different, their results cannot and should not be combined. And this is the greatest strength of the scheme.

The areas of pupil growth covered by this scheme are scholastic achievement, intelligence, physical health, personal and social qualities, interests, attitudes and proficiency in co-curricular activities. Only the first of these areas can be evaluated through external examinations, whereas others demand continuous evaluation through a wider variety of tools like check-lists, inventories, profiles, rating scales and schedules, besides those utilized by the external examinations.

The scheme provides for a separate certificate of internal assessment to be issued by the school under the seal of the Board. It also requires the evaluation of only those qualities for which evidence may be available. Furthermore, the certificate of internal assessment mentions only those qualities in which the student possesses positive ratings. This makes the certificate an assert for all students, for it mentions what the student is capable of doing well and not what he cannot do or finds it difficult to do.

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It is this concept of internal assessment which has stood the test of time and appears to be the most sound of those prevalent.

Specific caution may be sounded in respect of the practice of allotting a certain percentage of marks to internal assessment out of the total marks allocated to the subject. This view has also been categorically stated by the Kothari Commission.

A comparison of internal assessment and external examinations on some major aspects will further clarify the point.

<i>Criteria of Evaluation</i>	<i>Type of Evaluation</i>	<i>External examination</i>	<i>Internal Assessment</i>
Purpose		Assessing Achievement	Promoting pupil growth to the optimum level.
Coverage		Scholastic Areas	Both scholastic & non-scholastic areas-achievement, interests attitudes, personal & social qualities, physical health, Intelligence etc.
Tools of Evaluation		Questions papers, viva voce, some practical exercises	Rating scales, checklists, inventories, schedules in addition to question papers oral questions & practical exercises.
Periodicity Use of test results		In strokes Grading, classification	Continuous Diagnosis, guidance, remedial & enrichment instruction, academic prediction besides grading classification and certification.

The above comparative statement would help in the evolution of the concept of internal assessment that could find application in our country. It also dispels several unfounded fears. If developed scientifically with

necessary safeguards, internal assessment can even be conceived as a viable alternative to external examinations.

Question Banks

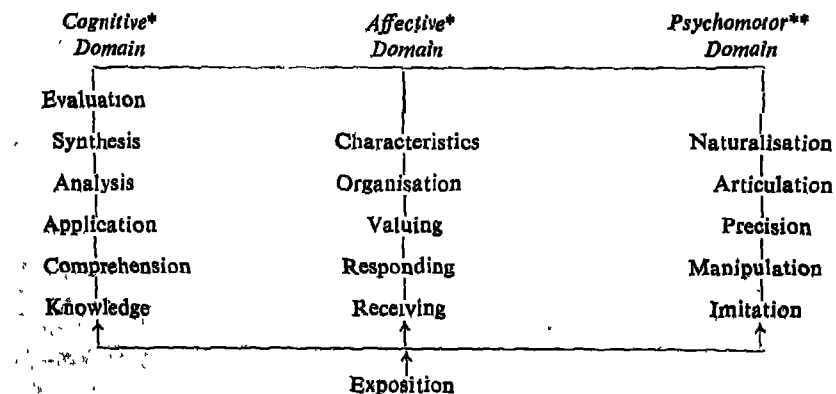
This is yet another comparatively new addition to the technical terminology of evaluation.

Operationally, a question bank is a part of the test library, which consists of full tests, unit tests and individual questions. The term 'question bank' refers to the last of these three items and therefore connotes a *pool of questions*.

A technically sound question bank would consist of questions spread over the varied aspects of the different units of a course at a particular level. These individual questions could be of different forms—essay type, short answer type, very short answer type and objective type. A pool as a whole would also stand classified in terms of the taxonomical objectives of instruction.

The *CAP classification of instructional objectives* is given below for reference :

A COMPOSITE MODEL OF TAXONOMIES OF COGNITIVE, AFFECTIVE AND PSYCHOMOTOR DOMAINS



*Proposed by B.S. Bloom, *et al.*, *Taxonomy of Educational Objectives—Cognitive and Affective Domains*, David McKay Company, Inc., N.Y.

**Proposed by R.H. Dave in *Developments in Educational Testing Vol. I*, University of London Press, London, 1969, p. 203-214. Also combined three Domains into a Composite Model.

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Each of the objectives is further divided into behavioural specifications, which give the various proficiencies a student should develop and show to prove the achievement of the particular objective on his part. For example, to prove that he understands a particular concept, he should be able to discriminate between that concept or sub-concept and others, classify them, compare and contrast them, identify cause-and-effect or sequential relationships between them, give examples of and about them, detect and correct errors about them, etc. All this should be the outcome of different doses of instruction and learning administered for the achievement of the objective and should be abilities which he did not possess prior to his developing an understanding of the said concept. Individual questions, which constitute the item banks, should really be constructed to specifically test these behavioural specifications rather than the objectives, which are broader in intent and may combine a number of specifications.

Thus, there will a hierarchy even in the individual questions of a question bank, so far as the abilities tested by them are concerned. Besides, being aimed at testing definite objectives and specifications, each question will as well be testing a certain topic and sub-topic. It will also be pitched at a certain level of difficulty (easy/average/difficult) which an experienced teacher could roughly estimate even without a formal try-out and statistical calculation of the level of difficulty. Though it is best to try out the items, it may not always be possible to do so in India where standardized achievement tests are not widely used. The teacher's estimate about the level of difficulty could be easily trusted. Indeed, it was even found to correspond broadly to the statistically calculated difficulty level in an experiment conducted by the Examination Reform Unit of the NCERT. All these identification data should be given on the card on which a particular question is preserved.

Preparation of questions for the question banks is important, as on it depends the quality of the bank. Each question should satisfy the rules for framing a question.

The concept of a question bank is not universally appreciated, and some people think it is just a collection of questions on various topics. They neglect the important aspect that questions are meant to test not only certain areas of content but also some objectives. Therefore, most of the questions in their question banks only test memorization of information and those testing higher objectives are almost completely overlooked. There are many people who still entertain this concept of question banks because of their unfamiliarity with the technical aspects discussed above.

The use of the item banks is the most crucial of the issues involved. Some people believe that all the questions of the question banks should be

made available to the students prior to their examinations, as this would help them prepare better. An extreme view of the same category is that there should be just 50 or 100 questions framed for a course, which should be passed on to the students and that the questions for the final question paper should be selected from this very pool. Yet another slight variation in the approach, which some others entertain, is that 75 per cent of the questions in a question paper should be out of the questions given to the students, while 25 per cent may be the teachers' own contributions.

It is difficult to recommend this approach, particularly because the giving away of questions (to be used in question papers) to the students in part or whole would mean the *collapse of the taxonomy*, as all the questions so passed on to the students will be reduced to just knowledge or recall questions. This would defeat the very purpose of evaluation, if higher objectives are permitted to be overlooked by any advertant or inadvertant process of elimination.

This should not be taken to mean that students should not have any set of questions to prepare from. In fact, as many questions as possible, of different forms and testing different objectives, should be made available to them. Even unit tests and full tests based on the courses should be circulated among them. But the questions in the question paper should be new to them, so that memorization does not determine success in the examination.

Furthermore, with the introduction of short answer and objective-type questions, the number of questions set for a question paper will naturally increase. Framing a large number of questions would be a problem for paper-setters. If the written examinations are planned in a scientific manner, this problem will turn out to be a very serious one for, the paper-setter, who must frame the blueprint on the basis of the design provided to him, will find his competence fixed in framing questions with definite dimensions of objectives, forms and content areas. Partly to overcome this problem as also to ward off the danger of the collapse of taxonomy, a *confidential question bank*, specifically for the use of the paper-setters may be maintained. The paper-setter, however, should continue to enjoy his traditional freedom and may at his own discretion adapt or adopt the questions in the question bank or frame original ones according to the needs of the blueprint. However, in order to satisfy the important criterion of validity, the questions incorporated in the question paper ought, essentially, to be unfamiliar to the students. *Also, the argument that a student who knows the answer to a large number of questions deserves to pass, looks utterly inadequate and flimsy to the evaluator, the criterion of validity, particularly in respect of the higher objectives of taxonomy, being crucial.*

Options in Question Papers

Options again is an area about which there is no consensus of opinion among teachers. They are commonly upheld on the ground that individuals vary with regard to performance and ability and these differences ought to be recognized. Another argument posed in their support is that they give confidence to the examinee : if he does not know the answer to one question, he can surely answer another.

The traditional pattern of options in question papers is where students are given eight or ten questions and are required to attempt any five or so. Normally, all questions carry equal marks. The fallacious presumption of this situation is that if a student knows one topic, he knows the others as well. Sometimes, two questions of differing difficulty, requiring widely varying spans of time for answering them, are allotted the same marks.

The most important of the shortcomings of this system is that several permutations and combinations are available to the students to choose from, and this could mean the solution of several hundred different question papers by the students. Yet their scores are compared for determining ranks. Such a situation could be compared with the situation when a student jumps five feet in a high jump event and the other jumps eight feet in a long jump event and the performances of the two are compared and the second student is adjudged superior in performance to the first, because he has been able to jump three feet more. Though we are not ready to accept the latter comparison, we have been accepting the former absurd comparison of marks ungrudgingly, while the nature of the comparisons made is basically similar.

Another shortcoming of options is that they encourage selective study among students and selective teaching on the part of teachers. They also imperil more than one criterion of good testing. They are the greatest curse of written examinations. Overall options have in fact no place anywhere. Internal alternate options could be allowed, but only in the essay type questions, after ensuring that both alternatives are equivalent i.e. they test the same objective and area of content, are of the same form and level of difficulty and require the same time for answering them. In spite of the above suggestion, it is difficult, on the whole, to justify options or support them in any scheme of examination.

Conclusion

By way of conclusion it may be said that confusions are rampant in the

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field of examination reform, many of them conceptual confusions.

Through the above discussion, only a call is made for seeking greater clarity about the merits and demerits of different issues, with a view to adopting approaches that are academically sound and practicable in our situation. On the success of this venture would depend the success of our educational system. ☐

Whither Internal Assessment ?

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THE ORIGIN of the examination system can be traced back to antiquity. Examinations are as old as the formal system of education. The history of education provides enough evidence to conclude that various types of examinations were an integral part of the system of education even in the past. There was an unique method of assessment in vogue in ancient India; this was the oral-aural method, which was replaced by the written examination when schools on the British model came into existence. But the written examinations have been found to be quite inadequate as a means of assessment of the pupil's work. Several committees and commissions appointed by the Central and State Governments to go into the problems of education, have all been opposed to the written external examinations at the end of the year. According to the University Education Commission (1948), if any reform in our education system has to be brought about, it must first be brought about in the examination system. The secondary Education Commission (1954), as well as the Education Commission (1966), opined that the final assessment of the pupil's achievement should not be based entirely on the results of the external examinations. Other things such as internal tests and school records must be taken into consideration. The opinion of several educators

is summarized in what Rama Sarma (1970) said: "The old system is considered to be thoroughly unsuited to the present day conditions and the consensus is that it has outlived its usefulness. The only concrete suggestion that is made by almost all educationists is that internal assessment should be introduced in the place of the present system of examination." The University Grants Commission has since selected a few universities to try out internal assessment as an experiment.

Studies on the attitude of students towards internal assessment by Venkata Rami Reddy (1975) and others have shown that the students feel that many external factors affect the evaluation of their performance by the teachers, though teachers do not entirely agree with this. Students feel that the teachers may boost the marks of undeserving students and give less marks to deserving students because of extraneous considerations.

But very few empirical investigations have been carried out to prove or disprove this point of view. An investigation into this would help plug the loopholes, if any, in the system of internal assessment. Further, the practice in some universities is to get the answer papers evaluated by two examiners, who do not know the marks given by each other. The correlation between the marking of the two examiners would throw light on inter-examiner consistency.

METHOD

In the present investigation the marks of 29 students in a post-graduate class are analysed. They had five theory papers and a dissertation. Each theory paper was valued for 100 marks, out of which a maximum of 25 marks was for internal assessment and a maximum of 75 marks for the university examination held at the end of the course. The marks in the internal assessment and the university examination were added without any scaling. There was no internal assessment for the dissertation. The internal assessment for each of the five papers was done by the teacher who taught the particular subject. (Each paper was handled by one teacher). The marks awarded in internal assessment were supposed to be based upon tests conducted 'periodically' by the teacher who taught the subject. Though no *strict* rules were laid down about the timing or the number of tests to be conducted, usually three to five tests, spread over the course, were held in each subject. No other criteria were enunciated for giving internal assessment marks.

In the case of the university examination conducted at the end of the course, a system of double evaluation was followed, where two examiners

evaluated each of the papers. One of the examiners was 'external' and the other 'internal'.

The external examiner for any subject invariably belonged to some institution outside the university area. The evaluation done by them is designated as 'external valuation' (EV). The internal examiner was usually the person who taught the subject to the students (though this was not a necessary condition). The evaluation done by him is designated as 'internal valuation' (IV). Each of the examiners for the different subjects evaluated the papers and sent the mark-lists to the university. They were not expected to write down the marks awarded by them on the answer books. The candidate was awarded the average of the marks given by the two examiners. Identification of the papers was very difficult, if not impossible, because the papers were renumbered confidentially. No detailed marking scheme was given to the examiners.

Thus, for each of the papers, each student in the group had three sets of marks—those he got in (1) internal assessment (IA), (2) external valuation (EV) and (3) internal valuation (IV). All relevant product moment correlations between the three were calculated for the different papers. Further, the effect of IA on the final grading of the students was also studied.

DISCUSSION OF RESULTS

Table 1 shows the mean scores and standard deviations of the group in the different papers in the different evaluations, viz. internal assessment (IA), external valuation (EV) and internal valuation (IV). As has been stated earlier, the maximum for IA was 25 marks, whereas the maximum for EV or IV was 75 marks. However, the mean scores are shown in the table as percentages to facilitate easy comparison.

TABLE 1
MEAN SCORES AND SDs OF THE MARKS OBTAINED BY THE GROUP OF STUDENTS IN THE THREE EVALUATIONS IN THE DIFFERENT PAPERS

		<i>Paper</i>	<i>Paper</i>	<i>Paper</i>	<i>Paper</i>	<i>Paper</i>	<i>Total</i>	<i>Dissertation</i>
		<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>(Theory only)</i>	
IA	M%	69.36	72.68	71.88	73.36	69.24	71.34	
	SD	2.00	2.28	2.08	2.27	1.71	7.86	
EV	M%	45.52	56.37	56.23	60.51	57.65	55.26	57.69
	SD	5.11	6.24	7.08	6.88	5.24	7.26	7.56
IV	M%	53.20	58.25	64.83	62.95	56.88	59.22	64.90
	SD	5.26	4.71	9.28	7.27	6.74	7.51	6.91

It could be seen that the marks given in IA were consistently higher than those obtained either in EV or IV. The marks obtained in IV were higher than those awarded in EV in all the papers. The greatest difference was in Paper I, where the mean in EV was 45 per cent, while the mean in IA was 69 per cent : a difference of 24 per cent. Putting all the theory papers together, the average marks obtained in the university examination was 57.28 per cent, while the average in IA was 71.34 per cent.

The correlation coefficients between the three types of evaluations are presented in Table 2. An examination of the table shows that many of the correlations are very low and a few of them are even negative.

TABLE 2
CORRELATION COEFFICIENTS BETWEEN THE THREE EVALUATIONS
FOR THE DIFFERENT PAPERS

<i>Correlation between</i>	<i>Paper I</i>	<i>Paper II</i>	<i>Paper III</i>	<i>Paper IV</i>	<i>Paper V</i>	<i>Disser- tation</i>
IA & EV	.119	— .200	.435*	.386*	— .030	—
IA & IV	.169	.075	.435*	.476*	.224	—
EV & IV	— .002	.608**	.799**	.594**	.624**	.304

IA total and theory total (excluding IA) $r = .370^*$

IA total and Dissertation (EV) $r = .030$

IA total and dissertation (IV) $r = .500^{**}$

Dissertation average and theory total (excluding IA) $r = .200$

Note : ** r significant at 0.01 level

* r significant at 0.05 level

Others not significant at 0.05 level.

In Paper I, the correlation between IA and EV was .119, while that between IA and IV was .169, both of which are very low, indicating that the performance of the students during the course, on the basis of which marks in internal assessment are supposed to be awarded, has very little to do with their performance in the university examination at the end of the course. Bennur (1971) also reported some very low correlations between the marks obtained in internal assessment and university examinations. Some glaring differences were noted by Tare (1971), between marks obtained in the internal tests and the university semester examinations.

Surprisingly, the correlation between EV and IV was negative, though quite low. This shows that if the grading of the external examiner is increasing in one direction, that of the internal examiner is increasing in the opposite direction. This is a striking example of the unbelievable

inconsistency between two examiners who evaluate the same set of answer papers.

In the case of Paper II, the correlation coefficient between IA and EV was $-.200$ and that between IA and IV was $.075$, both of which are not in any way symptoms of a sound procedure of evaluation. However, the correlation between EV and IV was $.608$, indicating a moderately high relationship between the evaluation procedures of the two examiners. The correlation coefficients for Paper V present a very similar picture. The reasons for such correlations may be an erroneous IA, the EV and IV being sound; or a defective EV and IV (the defect being in the same direction) while the IA is sound. The first possibility is more probable.

The correlation coefficients for the third and fourth papers are not very discouraging. The moderately high correlation in Paper III may be due to the fact that it contained some mathematical problems, in the evaluation of which there could not be much inconsistency between two examiners.

The correlation between the two evaluations of the research reports was also low ($.304$). The mean scores for EV and IV were 57.69 and 64.90 respectively. In most of the cases the grading of the internal examiner was higher than that of the external examiner. The low correlation between the two evaluations of the dissertation indicates that proper guidelines for evaluating them were not provided.

The correlation between theory total (excluding IA marks) and dissertation was also low ($.200$), while that between IA total and dissertation (EV) was only $.030$. If doing research either on a small or a large scale involves intelligence and hard work, on which factors internal assessment marks should also depend, the above correlation coefficient is absurdly low. The moderately high correlation ($.500$) between IA total and dissertation marks (IV), viewed against the background of a low correlation between IA total and dissertation marks (EV), shows that there is some defect somewhere, either in IA, EV or IV, or in all of them. That the correlations between IA and EV were low or negative, especially in Papers I, II and V, while the correlation between EV and IV was moderately high in many cases, indicates that the defect may be more in the IA.

The relation between IA total and theory total (excluding IA marks) was also low ($.370$). The rank order correlation between the two was as low as $.290$, showing how much the rankings in the two sets of marks have differed. It appears as if the apprehensions of the students, that some students may be deliberately pushed up while others are pulled down, if IA is introduced, are not entirely baseless.

A further examination of the total marks in IA showed that, out of 29 students, seven were given distinction (75% and above), 21 were given

first class (between 60% and 74%), while only one student was given second class marks (between 50% and 59%). When the total marks obtained in theory in the university examination were considered, there were only 11 first classes, 17 second classes, one third class, and no distinction. When these marks were pooled together with the marks obtained in internal assessment, there were 16 first classes and 13 second classes. The IA, therefore, boosted the total marks and the classes obtained.

When the marks in the dissertation were also added to the marks obtained in the theory papers, there were 17 first classes and 12 second classes. The dissertation helped two students to get a first class, while it pulled down one from a first class in theory to a second class on the whole.

CONCLUSIONS

The correlation coefficients between the marks in internal valuation, external valuation and internal assessment were generally low. Internal assessment boosted the total marks obtained by the students. The higher marks in internal assessment may be attributed to the desire of the teacher to improve the position of the student in the final examination. But, unfortunately, this inflation was haphazard, which is indicated by the low rank correlation between internal assessment and university examination marks. Though one cannot hope to get a perfect correlation of 1.00 between the two, a high rank correlation is to be expected. Thus, the fears of students that the marks of some undeserving students may be bolstered while some deserving students may be marked down, if internal assessment is introduced, do not seem to be baseless. Attempts at evolving a totally foolproof system of internal assessment must be made before introducing internal assessment in the place of external examinations.

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Actors and Reactors in Educational Change

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INTRODUCTION

EDUCATION needs reform. This is the most often-repeated statement on education in India, and other countries as well, in the last two decades. But it does not appear to be very clear what specific educational changes are required. However, that Indian education needs reform is an accepted fact. Institutions at various levels are always carrying out educational innovations. Apart from the existing institutions, new organizations have also been established for this purpose. Researches are being conducted at university departments, the NCERT, the Centre of Advanced Study in Education, boards of secondary education, and numerous other bodies. Curriculum innovation, innovation in teaching methods, textbooks, evaluation, student services, community relations, etc. are the specific areas of change to which much attention has been given. But the bringing about of change depends, besides the new contents, on the dynamics of change. The major research organization and change agent in the country (NCERT) perceived this difficulty in promoting new ideas. This prompted the organization of the first seminar in the area in 1966 at Osmania University. The seminar

was followed up by research studies at various levels. This paper intends to review these studies with a view to presenting a picture of the sociology of the process of change in Indian education

The review has been done in terms of the objectives, methodology, and results of the study..

The first research study in this area was conducted by Subbarao (1967). This is an extensive survey of the innovations being floated and their sources, although the major concern was to find out the factors contributing to and inhibiting the diffusion process. Bhogle (1969) mainly intended to study the psychological and organizational correlates of innovation acceptance. She included the organizational variables like size, type and age of the school, psychological characteristics comprising personal characteristics of the teachers like age, qualifications, teaching experience, sex, salary, number of institutes served and number of periods taken by the headmaster and the teacher, and psychological characteristics which included the headmaster's leadership style, attitude towards teaching, and role conflict. Buch (1972) studied the degree to which headmasters are responsible for the diffusion of an innovation. It was the first study to deal exhaustively with the characteristics of headmasters which included 49 variables under the heads—Institutional Category, Role Perceptions, Perception of Superiors and Superior Relations, Communication Behaviour, Psychological and Personality, Community, Organizational Climate and Miscellaneous. Rai (1972) studied 30 different aspects of teachers—the ultimate users of innovations—affecting the diffusion of an innovation. The studies by Zhaveri (1969), Patel (1971), M.B. Patel College of Education, (1972) Buch and Buch (1973) examined the factors affecting innovations leading to change. Bhagia (1973) studied the perceived characteristics of innovations affecting the diffusion process. The study by Doctor (1973) also concentrates on the factors affecting innovation. Mukhopadhyay (1973) studied system as well as socio-psychological barriers to educational change at the secondary level. Joshi's study (1973) is an exception in the tradition. He made a survey of innovations that have been floated in teachers' colleges in India, U.S.A., Great Britain, Australia and south-east Asian countries. In brief, the major objectives of these researches have been to make a survey of innovations and their sources and to find out the factors affecting, positively or negatively, the diffusion of innovations. These factors again are mainly the organizational aspects of the institutions and the personality dimensions of headmasters, teachers and others involved in the process. On the basis of the purposes of the study, respective methodologies have been designed.

In terms of methodologies that have been used, the studies can be

classified mainly in two groups. One group consists of simple descriptive surveys and the other of prediction studies. The first group is the major group which covers the studies of Subbarao, Bhogle, Zhaveri, Patel, M.B. Patel College of Education, Joshi and Buch and Buch (1973). The other group comprises studies by Buch, Rai and Doctor. With a view to making a qualitative and depth study, Mukhopadhyay used the case-study approach. So far as designs are concerned, they are, without exception, ex-post-facto ones.

All the studies have used statistically large samples (above 30) excepting the three studies by M.B. Patel College of Education, Zhaveri and Patel, who have used a sample of 20. Bhogle included 30 schools for her study. Subbarao conducted his study on 83 schools. All the others lie in between. All the studies were conducted in the secondary schools of Gujarat and Andhra, except for Joshi's study. The technique has mainly been stratified random sampling. Stratifications have been done usually on single sex v/s co-educational institution, urban/rural setting, new/old type of management, size of the school, etc. Mukhopadhyay (1973) took up one district for his study and the actual sample comprised D.E.O.'s, E.I.'s and three schools.

Regarding the tools, it may be said that the questionnaire was mainly used, and at times supplemented by interviews, usually structured. Bhogle (1969) prepared six different tools including instruments to measure leadership style, cosmopolitaness, and role conflict. The group of investigators who conducted prediction studies—Buch (1972), Rai (1972) and Doctor (1973), mainly followed the Rogers, Joyace *et al*'s (1966) style of instrumentation. Buch (1972) prepared one more instrument to measure the adaptability of Indian schools. Mukhopadhyay used interviews, Miller's test of change proneness and examination of records for his study. One special feature is that he used the team interview technique. The interview was held on a semistructured schedule. These tools were mainly administered in person by the investigator, still an Indian tradition, except in the case of Buch and Buch's (1973) study where some 15 trained researchers were sent to interview the principals in a structured schedule.

The most crude statistics of percentage and frequency are the common practices in the survey type of study. Bhogle computed Phi-coefficients as well as multiple correlation. The prediction studies invariably followed the Rogers tradition. These are the 'multiple correlation prediction studies'. Besides simple linear correlation of each variable with the criteria variables, the multiple correlations, followed by stepwise regression equation, were computed. Buch and Rai calculated the variance of factors for the criteria. These prediction studies made use of the t-test also to find out the signifi-

cance of difference between the two groups of adaptable and non-adaptable schools. Bhagia (1973) used the K-S test to test the significance of difference between adoptors and non-adopters. The various statistical treatments of data yielded a number of interesting results. The findings of these studies are dealt with here.

The studies explored, as stated earlier, mainly three areas—the various types of innovations, the major sources of innovation and the factors affecting diffusion of innovation. Subbarao's study (1967) revealed that about 45 innovations which can be grouped under a few heads, *viz.* syllabus and classroom instruction, teaching of skills, enrichment of knowledge by different media and methods, provision of variety of experience, student services, new practices in examinations and evaluation, and school administration and community relations, are in different stages—from diffusion to adoption. But Zhaveri (1969) revealed that innovations and changes were in the fields of school management, the headmaster and social relations, the school building, the teaching-learning process and co-curricular activities. Buch and Buch (1973) located thirty innovations, scattered over various areas of education, that were being implemented in Gujarat secondary schools. Among them, weekly and periodical tests, regular staff meetings, internal assessment, weightage to different examinations to decide promotion, improved questionnaires, cumulative record cards, science charts, planned programmes of school assembly, educational and vocational guidance are the most widely known and practised innovations. A study by M.B. Patel College of Education (1972) collected 37 innovations under the broad heads of school administration (4), school organization (10), curriculum (3), classroom teaching (7), examinations (7), and physical education and co-curricular activities (6) being practised in the secondary schools of Gujarat. Bhagia (1973) also made a survey for her study, out of which she chose 14 innovations. All these major or minor surveys point in the direction of change and show the differential magnitude in different areas. Joshi's survey is at another level; he deals with teacher-training. He surveyed the innovations floated in colleges of teacher-education in India, U.S.A., Great Britain, Australia and south-east Asian countries. He found that in curriculum innovation, the integrated four-year course and the interdisciplinary approach were common to all the countries under consideration. Population education was introduced in India, U.S.A. and south-east Asian countries. Other innovations worth mentioning were special programmes for urban teaching, inner-city schools, ghetto schools, and special courses for culturally disadvantaged and backward children (in U.S.A.). In methods of teaching, which includes student teaching, the major innovations were programmed learning (India, U.S.A. and U.K.), micro-

teaching (India, U.S.A., U.K. and Australia), paid internship (U.S.A.), block practice/internship (India, U.S.A. and U.K.), open air sessions (India). In inservice education, Joshi found that the major innovations were correspondence courses and summer course teaching, common to all the teacher-education programmes of the countries under study. The other new practices were exchange of teachers to study experiments conducted by schools (India, U.S.A and U.K.), intensive school improvement programmes of the extension centres (India) and the open university (U.K.). In the field of research in education, the major innovations were the establishment of NCERT and CASE (both in India), and research and development centres in U.S.A., to conduct and coordinate advanced educational research.

One very relevant comment about these findings is that the number of teachers' colleges in India as well as U.S.A. is large and the programmes differ significantly from State to State, and from province to province due to the constitutional provision for education as a State subject. Hence it may be assumed that most of the innovations mentioned here have been and are being tried out in a very small number of institutions, at least in India. However, there are innovations taking shape in some or the other corner of the country.

Besides Joshi's study, all the other studies are in secondary education. Also, they are supplementary to each other. The major areas of innovation in secondary education have been the curriculum, teaching methods, student welfare, co-curricular activities, and school management. However, the magnitude of change has been different in different areas.

In Indian education, various educational as well as non-educational agencies have been found to be active. But in innovation diffusion, the number is limited. The major agents or sources, as Rao's (1967) study reveals, are the extension service departments of teacher-training colleges, headmasters, seminars, workshops, inspectorates, teacher-training college personnel, educationists, books and magazines, visits to other institutions and other countries, visitors, experts, State departments of education, State evaluation units, S.S.C. Boards, employment bureaus, research laboratories, universities, scientists, and headmasters' associations. Patel's study (1971) also supports the findings. Buch and Buch (1973) found that in the order of importance, training college personnel, seminars, departments of extension services, directorates of education and journals, act as powerful sources of innovation.

As stated earlier, the major emphasis in diffusion studies has been on the factors affecting the process. All the studies have concentrated on this aspect. However, various dimensions of influencing agencies have been dealt with. All the factors can be classified precisely in two groups—the

organizational factors and the personnel factors. The organizational factors include the structural background of the school as an organization. The personnel factors include various demographic, psychological and personal aspects of the users of the innovation—the headmasters, teachers, students, community, etc.

So far as organizational factors are concerned, Rao's study (1967) reveals that single sex institutions are more innovative than co-educational schools. Schools with higher class-teacher ratio, student strength between 500 to 750, and under the management of a university, a mission or industry, are more innovative. Rao found that higher secondary and multipurpose schools were more innovative than ordinary high schools. He also found that buildings, furniture, books and magazines and audio-visual aids contributed to the innovativeness of school. Bhogle (1969) found that large schools, multipurpose schools and schools with cosmopolitan staff were more innovative.

The demographic and psychological dimensions of the users are mainly dealt with in two groups—that of headmasters and teachers. The other parties involved are students, parents and the community, but they have not been dealt with at length. The other classification of 'dealt with' variables is the perception of their role in certain terms and innovation and factual personality characteristics.

The major study on the headmasters' personal and attitudinal aspects is by Buch (1972). But Rao (1967), Bhogle (1969) and Bhagia (1973) contributed significantly to the subject. Buch (1972) found that inservice training, feeling of security, perceived self-rated, peer-rated, inspector-rated, training college personnel-rated and teacher-rated administrative ability, perceived equalitarian relationship with the training college personnel and their support of innovation, frequency of professional meetings attended, number of organizational membership, inter-school visitation, cosmopolitan orientation, community involvement, parents' involvement in the school, interest of the management, distance of the training college (outside the city) from the school and perception of the ability of training college personnel to provide expert guidance were important. Rao's findings (1967) are almost similar with regard to inter-school, State and country visitation. Rao found that academic and professional qualifications of the headmaster influenced the diffusion process whereas Buch found no relationship between the qualifications of the headmaster and the adaptability of the school. Bhogle (1969) found that the democratic headmasters with a favourable attitude towards teaching, with high salary, low role conflict and long teaching experience were more ready to accept innovations. Her findings too are different from Buch's (1972) as the latter researcher found

no relationship between school adaptability and variables like experience, long duration of service in the same school, and role satisfaction. However, out of the 49 variable studies by Buch (1972) only 13 variables have been found to be predictors of school adaptability, yielding an R of .7536 and a variance of 56.8 per cent. These variables are inter-school visitation, self-rated administrative ability, parents' involvement, professional meetings attended, feeling of security, training college support of innovations, teachers' rating of administrative ability, inspectors' ratings of administrative ability, community involvement, equalitarian relationship with training college personnel, interest of the management, self-rated administrative ability and cosmopolitan orientation. It was also found that in stepwise regression the addition of any variable after the first five does not increase the multiple R (.7277) significantly and hence the first five out of these 11 variables are the best predictors of school adaptability.

Teachers as a unit of study have been mainly studied by Rai (1972). She studied 30 different aspects of teachers under the broad heads of demographical variables, institutional category, communication behaviour, psychological and personality variables, socio-economic status and organizational climate. Most of the other researchers, viz. Rao (1967) and Bhogle (1969) also highlighted some aspects of teachers' characteristics influencing the diffusion process. As stated earlier, Rai studied the impact of thirty variables on four criterion variables, the four dimensions of diffusion of innovation. A few interesting features are that there was no variable among the 30 aspects, which is a common predictor for all the four criterion variables. Teachers' educational qualifications, recency of training, perceived psychological distance between self and principal, perceived frequency of general horizontal communication, professional orientation, and conservativeness v/s radicalism have no influence on innovation diffusion. In stepwise regression, it has been found that self-designated opinion leadership, exposure to wider environment, general mass-media exposure, age, socio-economic status, teachers' perception of students' attitude towards the innovation, perceived principal's support of the innovation, perceived frequency of horizontal communication about the innovation, perceived change orientation of the principal, together yield an R value of .3753, explaining 14.09 per cent variance in Time of Awareness. In case of Time of Adoption, perceived frequency of horizontal communication about the innovation, professional communication behaviour, ascribed opinion leaderships, feeling of security, cosmopolitanity, sex, age, vertical communication, self-designated opinion leadership, urban and rural background and attitude towards the teaching profession yield an R of .3413 and this explains 11.65 per cent of variance.

Seven variables, viz. teachers' perception of students' benefit from the innovation, perceived change orientation of the principal, ascribed opinion leadership, perceived cohesiveness of the school faculty, organizational climate, role satisfaction and need for autonomy give an R of .5964 with the criterion variable internalization explaining 35.57 per cent of variance. With self-perceived change orientation, six variables are significantly related. These are perceived change orientation of the principal, teachers' perception of students' benefit from the innovation, socio-economic status, perceived principals' support of the innovation, perceived source credibility of the principal and perceived psychological distance between other teachers and the principal which together yield an R of .5017 to explain 25.17 per cent variance of the criterion.

Eight predictors of the total score of all the four criteria variables are perceived change orientation of the principal, teachers' perception of the students' benefit from the innovation, ascribed opinion leadership, cosmopoliteness, socio-economic status, teachers' perception of the students' attitude towards the innovation, experience and general mass media exposure. Together, they yield an R of .5655 and explain 31.98 per cent of variance in the diffusion process within the school system.

Rao (1967) found that the schools with more trained, qualified cosmopolite staff are more innovative. Less turnover in staff, more inter-state and country visitation of staff with special abilities and having more professional behaviour are conducive to diffusion of innovations. Bhogle (1969) found that cosmopoliteness and age of teachers are significantly related to acceptance of innovation.

Out of all these variables, cosmopoliteness has been found to be the most common factor related significantly to diffusion of innovation.

A few other aspects highlighted by Rao (1967) reveal that in more innovative schools, educational and non-educational groups of the community are more interactive than in less innovative schools; parents take more interest in such schools. The more innovative schools are in touch with more cosmopolitan sources. They have impersonal sources, better financial resources, incur greater expenditure for pupils and staff salary.

A recent study (Bhagia, 1973) as stated earlier, concentrated on the perception of the characteristic of innovation and its diffusion. She found that in a perception of 20* specific characteristics of 14** different innova-

* The 20 characteristics studies are on adaptability, associability, communicability, complexity, flexibility, diversibility, efficiency, structuralization, academic effectiveness, burdensomeness or load factor, cost economy, pleasure, prestige, relative advantage, time economy, compatibility, dependence, facilitation, meaningfulness and practicability.

** The 14 innovations are institutional planning, unit plan, educational and voca-

tions, 11 characteristics were significantly related to diffusion of innovations in general. These were academic effectiveness, complexity, diversibility, efficiency, facilitation, meaningfulness, practicability, prestige, relative advantage, structuralization (all are significant at 0.1 level) and communicability (significant at 0.5 level). Bhogle (1969) also found that the innovations of science clubs, deputation of teachers to refresher courses and audio-visual aids were introduced as they were more compatible, more divisible and less complex than the innovation improvements of school library and guidance clinic.

A few other interesting findings come from the study of M. B. Patel College of Education (1972) which reveals that headmasters' leadership style, the financial position of the school and the value system of the institution influence the diffusion process. Of course, Bhogle (1969) and Rao (1969) have also contributed to the first two findings. Bhogle (1969) reveals that there is no relationship between adoption of innovation by the headmaster and the teachers of the same school. The schools with high adoption ranks have low ranks on teachers' acceptance. Buch and Buch (1973) found in their survey that the experimental attitude of the headmaster, academic interest of the schools and authority dictation were the major promoters of innovation diffusions. The reasons for not introducing innovations were teachers' attitudes (negative) and lack of efficiency, shortage of funds and non-availability of resources (academic). The reasons for discontinuation of an innovation were transfer of the teacher-in-charge, loss of interest of the teachers and loss of zeal as the innovation was found to be more time-consuming than expected and burdensome for the teachers.

Mukhopadhyay (1973) found that the administrative bureaucracy at the governmental level was a potent resistant to educational change. The role of the District Education Officers/District Inspectors of schools is not clearly defined and their administrative burden is almost unbearable. This goes with a lack of academic freedom. Of course, the non-professional life of the Education Officer is also to blame. These district level officers, due to the nature of their work and the offices they hold, are considered figures of authority rather than academic figures by the principals. This, instead of promoting innovations, hampers them at the internalization stage.

In a study on curriculum change in secondary schools in India, Dave found that the guidance of extension service centres and headmasters'

tional guidance, objective type test, cumulative record card, science club, work experience, co-operative store, provision for gifted children, special arrangement for backward children, weightage to periodical test for annual examination, hobby centre, parent-teacher association and staff seminar.

leadership were the most powerful facilitating factors, more important than the availability of material and technical aid, teachers' workshops and the guidance of foreign experts. Headmasters' leadership is characterized by giving support to teachers in taking up bold and imaginative experiments. He also found that "agencies such as teachers' colleges, educational inspectors and foreign experts did not seem to have played a significant role in bringing about educational change."

The monograph of NCIE reports seven experiments in education. Most interesting among them is the Vikaswadi project taken up by the Gram Bal Shikshan Kendra. As reported by Modak (1973), the Meadow School, for children occupied in grazing cattle and other farm activities, was a novel rural experiment. It was successful in teaching these children to tell the time from the shadows cast by objects, and to identify plants, trees and rocks. They were also instructed in simple hygiene and nature study through informal talks. Some knowledge of numbers was also imparted. Other commendable experiments were 'children's library' to prevent a relapse into illiteracy, a cooperative industrial production centre (*Bal Udyogalay*) and an orientation training programme.

The review of three studies suggests that this area of research has not yet become popular and has not yet been able to claim a commendable contribution to the knowledge of the sociology of the diffusion process in general and its operation in education in particular. Even in the case of publications in this area, we can only refer to a few papers, a book by Griffen and Pareek (1969) and one monograph by NCIE (1973). In the words of Ross, "This tradition is... of lesser significance in terms of its contribution of the understanding of the diffusion of ideas." The review of Pareek (1966) reveals that out of 125 studies in innovation diffusion, there is none on education. However, the studies completed till now are at least on count. The lead of Subbarao has been and is being followed up.

As a pioneer study in the field, Subbarao's study has identified problems and areas which need thorough investigation. Studies by Buch (1972), Rai (1972) and Bhagia (1973) are, again, more of a diagnostic nature, of course, to a much greater depth. These three studies have shed considerable light on three important aspects of the innovation diffusion process. Other studies are more extensive. But the result indicates that Buch's (1972) and Rai's (1972) studies need proper follow-up as the total variance has not reached a satisfactorily high level. Studies in farm innovations in India could locate the factors, through sequential efforts, which claimed a variance of more than 90 per cent.

Another feature of these and most of the ongoing studies is the concentration on the school system. Except for Subbarao, no one has tried to

study the impact of men and institutions outside the school.

Another feature of the Indian studies is that they are influenced, without exception, mostly by Rogers (Diffusion on Innovation). A look through all these theses indicated that in the conceptualization of the idea of research in this area, the major influencing agents were Rogers, Barnett, Bhola and Miles. Of course, numerous other researchers in agricultural, industrial and educational innovations have made an impression, but so far as methodology is concerned, it has been and is still being dictated by Rogers. Some researchers go to the extent of saying that 'the study was planned on the lines indicated by the studies conducted in three Michigan high schools by Lin, Nan *et al* (1966) and in Thailand Government high schools by Rogers, Joyce *et al* (1966)'.

It is also found that these studies do not represent an all-India sample as a whole. They have been concentrated mostly in one State. Out of the 14 studies reviewed here, ten were conducted in schools of Gujarat, one in Gujarat and Andhra, one each in Andhra, Rajasthan and Maharashtra. Of course, the ongoing studies represent various states, viz. West Bengal, Kerala, Mysore and Gujarat.

These studies show a wide range on contradictory as well as similar findings. Of course, most of them are similar. But Bhogle's (1969) findings contradicting the findings of Buch (1972) and Rai's study (1972) prompt at least a sociological difference between various States, if not something else also, and hence needs replication and expansion.

The ongoing researches in this area are mainly trying to focus on resistance to educational change, mathematical models of innovation acceptance, communication strategies, etc.

However small the number of studies, they have made a considerable impact on the various dimensions of planning for educational change. These studies have made a major breakthrough by changing the attitudinal superstructure about education and change. State departments are experimenting on schools to see if they can be made change-prone by putting differential control on various factors affecting the diffusion process. The Rajasthan Government has started a programme of inter-state school visitation programme for the headmasters. Numerous such examples can be cited to show change agents active in exposing headquarters and teachers in seminars, workshops, journals, etc. Regular changes in teacher education programmes, curriculum reconstruction and incidental social mobility are continuously helping shock-absorption from change and developing a fascination for change and cosmopolitaness. These endeavours have been tremendously influenced by the research in technology of change.

ACTORS AND REACTORS IN EDUCATIONAL CHANGE

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Frustration-Reactions of Seventh Grade Children

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The Indian adaptation by Udai Pareek of the Rosenzweig P. F. study was administered to 100 seventh grade children randomly selected from nine secondary schools of Patiala with a view to replicate the study and find out sex differences, if any. The administration and scoring procedure of the test as standardized by the authors were strictly followed. The results support the earlier finding in the areas of (a) G.C.R, (b) E-A, I-A, and M-A, (c) all factors and (d) E, E-I, super-ego patterns. Sex differences have been found in (a) E-A, (b) I-A, (c) E-E and M+I only.

THE original children's form of the Rosenzweig Picture Frustration Study (1948) was adapted for Indian conditions by Udai Pareek in 1959. It is a psychological instrument that aims to help in the understanding of reactions to frustration—a type of universal experience—individually and culturally. Udai Pareek took a sample of 1002 children from 4 through 13 years of age for standardization of this instrument and for preparing norms. According to his findings, the stability co-efficients of the instrument ranged from .51 to .78 and the consistency values from 51 to 99; the validity values also stood very high (Udai Pareek 1958).

FRUSTRATION-REACTIONS OF SEVENTH GRADE CHILDREN

Dr. Pareek, however, did not give any norms for boys and girls separately, and unfortunately not many studies (except by Kumar 1969 and Meenakshi 1974) in India were undertaken either to replicate or re-affirm the results or to compare the frustration-reactions of boys and girls. Hence this modest effort, which mainly aims at studying the frustration-reactions of seventh grade children and noting sex differences, if any.

Statement of the Problem

The problem is briefly stated as the frustration-reactions of seventh grade boys and girls.

Hypothesis

It has been hypothesized that there exist sex differences in frustration-reactions of children.

Sample

One hundred children, 50 boys and 50 girls studying in the seventh grade of nine secondary schools of Patiala were randomly selected to serve as subjects for this study.

Procedure

Data was collected by administering the Rozenzweig Picture-Frustration Test (Children's Form) adapted by Uday Pareek for Indian conditions in 1958 to 100 children specially selected for this purpose. The procedure adopted for administering the test was the one recommended by Rozenzweig and Uday Pareek in their manual (1959). At each administration only five to ten children were taken.

The test consists of 24 situations depicted in cartoon-like pictures. In every situation, a child is shown frustrated. In about half of the situations, the individual who inflicts the frustration, or is otherwise associated with it, is an adult, and in the other half, a child. Moreover, sometimes the adult is a female or a mother figure, sometimes a male or a father figure. Similarly, the frustrating child is sometimes a boy, sometimes a girl.

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The situations are both of ego-blocking and super-ego blocking types, out of which fourteen are of the former type and eight of the latter type. Two situations are ambiguous from this point of view. One significant relationship between the two types of situations is that in the super-ego blocking type there is usually some implication of previous ego-blocking with the present frustrator represented as formerly frustrated. The distinction is not to be regarded as absolute since the subject may interpret a super-ego blocking situation as ego-blocking, or an ego-blocking situation as super-ego blocking.

The scoring procedure as recommended by Uday Pareek (1959) was strictly followed. It was assumed that the subject unconsciously or consciously identifies himself with the frustrated individual in each situation and projects his own bias in the replies given. To determine this bias, scores were assigned to each response to indicate direction of aggression and reaction type. Under direction are included extrapunitive—in which aggression is turned to the environment, intropunitiveness—in which it is turned by the subject upon himself, and impunitiveness—in which aggression is evaded in an attempt to gloss over the frustration. Under types of reaction fall obstacle dominance—in which the barrier occasioning the frustration stands out in the responses, ego-defence—in which the ego of the subject predominates, and need persistence—in which the solution of the frustrating problem is emphasized. From the combination of these six categories, there result from each item nine possible scoring factors (and two variants, E and I). The letters E, I and M are employed to signify extrapunitive, intropunitive and impunitive directions of aggression in whatever combinations they occur with the type of reaction. To indicate obstacle-dominance an apostrophe (') is written after E, I, or M (capitals). The ego-defence types of extrapunitiveness, intropunitiveness and impunitiveness are signified by E, I and M used alone. To indicate need-persistence, e, i and m (small letters) are employed. The convention of writing obstacle-dominance first, ego-defence second and need-persistence third in a three-columnar arrangement has been adopted: O-D/E-D/N-P.

Scoring Consistency

For purposes of scoring, samples provided by Rosenzweig and Uday Pareek (1959) were very helpful but there were quite a few situations for which parallel samples were not available. In such cases, general directions for scoring were employed. Since the agreement between two scorings in one case between investigator I and investigator I and in the other case

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between investigator I and investigator II stood at 84.1 and 82.8 respectively, it was decided to accept the scoring consistency as considerably high.

Data and Findings

Data was quantified separately for boys, girls and the combined group, in the following way:

- (a) G. C. R's.
- (b) Directions and types of frustration-reactions.
- (c) Factors of frustration reactions.
- (d) Super-ego factors and patterns.

Findings of the study are reported below in seriatim in these areas.

I General Conformity Ratings

G. C. R. is a measure of conformity of an individual score to the model response of the group as a whole. The criterion scores for G.C.R. are based on a sample of 1000 children of both sexes of the age-group 4-13 years. Table I gives G. C. R's of the subjects in the sample of the present study.

TABLE 1
G. C. R's (PERCENTAGES)

Category	N	Range	Mean	Median	S. D.	S.K.	Ku
Boys	50	48	57.06	56.70	10.64	.35	.30
Girls	50	39	58.34	57.93	9.48	.16	.28
Combined	100	48	58.90	57.25	10.04	.49	.27

CR=.6, N.S.

Lange (1959) and Udai Pareek (1959) reported mean G.C.R. as 56.60 and 63.8 respectively. The present study almost supports the earlier findings. No sex differences were found in G.C.R. scores of boys and girls.

II Directions and Types of Frustration-reactions

The direction of aggression and the types of reaction of the respondents are presented in Table 2.

TABLE 2
SCORING CATEGORIES (PERCENTAGES) SEXWISE

<i>Scoring Categories</i>	<i>Boys, N=50</i>		<i>Girls, N=50</i>		<i>Combined N=100</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
E-A	50.6	13.8	51.3	11.2	50.95	12.5
I-A	24.2	15.2	23.1	8.4	23.65	12.2
M-A	24.3	9.2	26.3	9.6	25.30	9.4
O-D	14.7	4.0	16.8	4.8	15.75	4.1
E-D	52.0	10.0	50.9	9.6	51.45	9.5
N-P	32.5	9.6	32.3	9.6	32.42	9.6

From this table, it is clear that about 51 per cent children turn blame, hostility, etc. against some person or thing in the environment. Nearly 25 per cent of them evade blame altogether and regard the situation as unavoidable. In other words they absolve themselves of blame. The remaining 24 per cent children turn the blame or censure upon themselves. In short, one child in every four takes the blame, two turn the blame against some person or thing in the environment and one evades the blame by declaring the situation unavoidable. The percentage for E-A, I-A and M-A as found by Kumar (1969) were 51.5, 18.7 and 29.8 respectively. Pareek (1959) reported these percentages as 44.6, 25.4 and 30.0 respectively.

So far as the types of reaction are concerned about 16 per cent children fall under the scoring category O-D, which shows that responses are obstacle-dominant. Nearly 33 per cent children have responses indicating emphasis on the solution of the frustrating problem. There are 52 per cent children under the E-D category. Their responses show ego-dominance. In short, 16 per cent children are blocked by frustration, 33 per cent suggest some solution to the problem and about 52 per cent attack others or themselves. Kumar (1969) found these percentages as 15.6, 43.1 and 41.3 respectively. Lang (1959) reported these percentages as 19.3, 55.9 and 27.0 respectively. Pareek's results are 11.8, 55.8 and 32.2. It is clear that no conclusive inferences can be drawn.

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Factors of Frustration-reactions

When seen closely, the combination of six categories (Table 2) results in nine possible scoring factors including the two variants E and I. The responses of the subjects against these factors are given in Table 3.

TABLE 3
FACTORS (BY FREQUENCIES) OF FRUSTRATION-REACTIONS

<i>Factors</i>	<i>Boys, N=50</i>		<i>Girls, N=50</i>		<i>Combined, N=100</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
E'	1.57	.75	2.03	1.05	1.80	0.94
E	6.37	2.1	4.60	1.65	5.48	2.08
e	3.47	1.35	3.68	1.20	3.57	1.28
I'	1.03	0.21	1.35	0.45	1.19	0.30
I	3.47	1.20	3.32	1.05	3.39	1.12
i	1.81	1.05	1.60	1.05	1.70	1.05
M'	1.34	1.59	2.24	0.90	1.79	1.30
M	2.33	1.05	2.33	1.05	2.33	1.05
m	1.87	0.05	2.27	0.90	2.01	0.98

It is clear that the highest mean score is against factor E, which means that among the subjects the greatest tendency is to turn the blame, hostility, etc. against some person or thing in the environment. This is supported by Shaw and Doris (1960). Further, one finds that there is a substantial tendency to expect a solution to the frustrating situation from someone else. The factor which ranks third in the list is I, which shows that the subjects put the blame on themselves. The factors coming next are M and m, which means that in the middle stand those who evade the blame altogether or hope that circumstances will themselves bring about a solution of the problem. This category consists of respondents who have patience and conformity as their characteristics. Other factors have almost equal mean scores. In other words, the subjects point out the presence of the frustrating obstacle or minimize the presence of the obstacle or offer solutions to the problem. The least score against I' shows that children who relish the fruits of adversity or to whom a frustrating obstacle does not seem to be frustrating are very few. These findings bear a $\sqrt{}$ of the value of 0.53 with those of Pareek (1959) and of .64 with those of Lange (1959) and of .72 with those of Shaw and Doris (1960).

Super-ego Factors and Patterns

TABLE 4
SUPER-EGO FACTORS AND PATTERNS OF FRUSTRATION-REACTIONS

	Boys, N=50		Girls, N=50		Combined, N=100		Com- Pareek Study bined N=237	
<i>Factors and Patterns</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD group</i>
E	9.3	7.2	8.4	4.8	8.85	5.2	8.0	4.9
I	10.9	5.6	9.5	4.8	10.20	5.3	5.3	2.8
E+I	19.1	7.6	16.4	7.2	17.75	5.6	13.3	7.8
E-I	19.5	7.2	19.1	7.6	19.30	7.3	23.8	10.1
I-E	5.98	4.4	6.3	4.0	6.10	4.2	4.5	2.7
M-A+I	34.7	10.4	33.74	9.2	34.20	9.5	34.1	11.4

The table points out that nine per cent subjects aggressively deny that they are responsible for the offence for which they are charged. Ten per cent subjects admit their responsibility but deny any essential fault by referring to unavoidable circumstances. Eighteen per cent children aggressively deny the charge and hold circumstances responsible for the situation. Nineteen per cent children are compelled by the super-ego to deny the charge even when no one is available in the environment to whom the blame can be shifted. Only six per cent subjects unconditionally accept the blame. Thirty-four per cent children do realize that something wrong has happened and they are involved, but they direct it to unavoidable circumstances.

The results of Pareek's study are quite similar to those of ours.

Sex Differences

t-values were worked out in the areas of G.C.R., scoring categories, factors and patterns. The only areas wherein t-values are significant are given in Table 5.

TABLE 5
SEX DIFFERENCES IN FRUSTRATION-REACTIONS

<i>Area</i>	<i>t</i>	<i>Significance</i>
E-A	3.8	.01
I-A	2.2	.05
E-E	3.69	.01
M+I	1.96	.05

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Sex Differences in Frustration-reactions

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So far as frustration-reactions in relation to sex are concerned, no significant differences have been found in G.C.R., M-A, O-D, E-D and N-P categories, and E', E, e, I' I, i, M' M and m factors, and E, I, E+I and I+I super-ego factors and patterns. Marked differences have been, however, found in case of I-A and E-A categories and E-E and M+I super-ego patterns. Girls, more than boys, have a tendency to turn the aggression to the environment (extrapunitive), while boys, more than girls, have a tendency to turn the aggression upon themselves. Also boys, more than girls, disown or deny the blame which cannot be assigned to anyone in the environment, and even after admitting the guilt, direct the fault to unavoidable circumstances.

Consequently, the hypothesis is partly sustained.

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A Study of the Impact of Teacher Training upon Attitude of Student Teachers Towards Teaching

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IN THE SCHOOL a teacher who has a favourable attitude towards teaching will enjoy teaching. Investigations carried out by Cook, Leads and Callis (1951) over ten years, indicate that attitudes of teachers towards children and school-work can be measured with high reliability, and that they are significantly related to teacher-pupil relations in the classroom. The favourable attitude towards teaching is likely to prove helpful to teachers in maintaining harmonious relations with their pupils, characterized by mutual affection and sympathetic understanding. In the studies conducted by Weber (1953), Centor (1953), Amatora (1955), Symonds (1955), and Ryans (1960) it was found that effective teachers have a genuine love and strong liking for young people, enjoy being with them, and have deep interest in, and get satisfaction from the job of teaching. On the other hand, teachers rated low in effectiveness in the study by Ryans (1960) were found to possess a critical attitude towards others and a less favourable attitude towards teaching.

A STUDY OF THE IMPACT OF TEACHER-TRAINING

Various courses and programmes of teacher-training are designed to augment the teacher's understanding of human behaviour. They claim to make available to prospective teachers knowledge about child behaviour, the learning process, adjustment mechanisms and other relevant areas. Thus, it is expected that all such programmes are likely to develop among pupil-teachers a positive and favourable attitude towards teaching. A number of researches to study the impact of teacher-training upon the attitudes of school-teachers have been made. A study by Hale (1954) revealed little change in a wide range of attitudes of student-teachers assessed at the beginning and end of a two-year teacher-training course. Symonds (1954) studied a sample of teachers by means of tests, interviews and observations. He concluded that methods and procedures learned during college preparation may influence teaching superficially but they do not determine the nature of relation of a teacher to his students or the teacher's basic attitude with regard to teaching. Bowers and Soar (1961) examined the relationship between human-relations training, teacher personality and teaching behaviour for a sample of elementary teachers. An initial analysis of variance and co-variance failed to identify relationships between change in teachers' or pupils' behaviour and the training programme. Koskenniemi (1965) in his longitudinal study reported that positive educational attitudes increase with teacher-training. Findings of these studies are, however, conflicting and no generalization of any kind is possible. This calls for further research in this area. Again, the results of these studies may not be applicable to Indian student-teachers as teacher-training programmes here are different from those followed in other countries. Hence, the present study was undertaken to study the impact of teacher-training upon the attitude of student-teachers towards teaching.

METHOD

Subjects

A sample of 80 student-teachers was selected randomly from B. Ed. students of the College of Education, Kurukshetra University. Being one of the best teacher-training colleges in Haryana, it selects students on the basis of merit and experience from almost all parts of Punjab and Haryana.

Tool

For assessing the attitude of student-teachers towards teaching in

schools, the investigator used a scale of his own. The scale has been constructed on the lines of Thurstone's method of equal appearing intervals. The final draft of the scale consists of 36 items. The Q-value of none of the items exceeds 1.97 and the average is 1.42. The split-half reliability has been found to be .856. The mean of the scale-values of all the 36 items in the scale is 4.03. (Koul, 1973).

Procedure and Results

The attitude scale was administered to 80 selected student-teachers at the beginning and completion of the B. Ed. training course. The attitude scores were obtained for both the trials and the technique of 'Analysis of Variance' was applied to study the significance of the difference in the means of the pre and post-training attitude scores. Because of the possibility of correlation between the attitude scores achieved by 80 subjects on the two trials of the scale, the total sum of the squares (SS) was broken down into three parts :

- (i) SS attributable to trials
- (ii) SS attributable to subjects and
- (iii) a residual SS usually called interaction—which measures the factors attributable neither to subjects nor trials acting alone, but rather to both acting together.

The total SS, the SS between the means of trials, the SS among the means of subjects, and the interaction SS were computed. The results of the analysis of variance are presented in Table 1.

TABLE 1
ANALYSIS OF VARIANCE OF ATTITUDE SCORES OBTAINED BY
STUDENT-TEACHERS BEFORE AND AFTER B. ED TRAINING

S. No.	Source of Variation	df	Sum of Squares	Mean Squares (Variance)	F
1	Between Trials	1	0.31	0.31	2.81
2	Among Subjects	79	25.04	0.32	2.91*
3	Interaction	79	8.92	0.11	
	Total	159	34.27		

*Not significant at .05 level for $df = (1, 79)$

Discussion

The means of the attitude scores of the student-teachers before and after B. Ed. training came out to be 5.53 and 5.62 respectively which are definitely above 4.03, the mean of the scale values of attitude scale. Thus, it may be inferred that the student-teachers, before and after training, had a favourable attitude towards teaching. But on applying analysis of variance, F-ratio for trials of the attitude scale failed to attain .05 level of significance. Hence, the hypothesis that existing programmes of teacher-training do influence the attitude of teacher-trainees towards teaching was rejected. In relation to this, it may be interpreted that the favourable attitudes of student-teachers towards teaching do not increase significantly in magnitude with the existing patterns of teacher-training. It is worth mentioning that an exhaustive study of students in teachers' colleges in New South Wales (Hale, 1954) has also revealed little change in a wide range of attitudes at the beginning and end of a two-year teacher-training course.

According to Likert (1952), the process of attitudinal change occurs constant as an approximate function of learning and the situational influences, which include reinforcing support of the groups with which an individual spends his life. Hollander (1967), in his comment on the findings of the researches in the field of attitudinal change, also remarks that in considering the dynamics of attitude change, the significance of two kinds of factors must be recognized, namely processing of new information through cognitive interaction and the impelling quality of social identifications in maintaining an attitudinal structure. In view of these considerations, there is need to modify the existing unrealistic curriculum of teacher-training. The set patterns and rigid techniques in practice teaching also require a drastic and immediate change. The Education Commission has pointed out that "methods of teaching and evaluation in training institutions are extremely important and the attitudes of the student-teacher will be influenced more by the methods used with them, than by what they are formally taught about the methods they should use in schools" (1964-66, p. 134). In the light of the same, the Commission (1966, pp. 134-35) has recommended that an attempt should be made to develop the student-teachers' maturity through contacts, experience, study and discussion; time should also be found to orientate students' attitudes to the significance and possibilities of the profession that they have chosen, to awaken a sensitivity to the human factors involved and to stress the social values of educational development.

As illustrated by Lewin's (1947) work, teacher-educators as a group in their respective institutions can serve as a vehicle for producing change in

the attitudes of student-teachers. They can do so, as Lewin has put it, through persuasive communication. To achieve some deliberate changes in the attitudes, it appears possible for teacher-educators to communicate directly with student-teachers—by talks, classes, workshops, seminars and group discussions.

Attitudes and interest are closely related concepts. The broader term is attitude, which subsumes interest. Blair and others (1962) say that interests are attitudes which cause a person to seek more activities in a given area; they are positive attitudes. The researches by Reid (1951) Darley and Haganah (1955) and Strong (1955), have indicated that interests are stable from age 17 onwards. The same may be true of attitudes as "both are descriptions of a readiness or proclivity of an individual to respond in a certain way toward something" (Blain, 1962). Attitudes, particularly during the periods of middle and late adolescence, are wrapped up with a person's feelings, needs, and self-concept. Thus, these periods can serve as fertile grounds for developing positive attitudes of student-teachers by taking the aforementioned factors into account. This can be done either by attracting fresh and bright young graduates to teacher-training or by encouraging integrated courses of general and professional education as organized by the NCERT in the Regional Colleges of Education with certain modifications and emphases.

Finally, attitudes of student-teachers towards teaching in schools cannot be said to be an isolated variable. It is consistently integrated with other aspects of teacher-trainees like their needs or desires for social prestige, income and professional recognition, unfavourable working conditions, inadequate supervision by authorities in schools, unsatisfactory policies of education departments, and uncongenial personal relationships. In relation to these, intensive and continuous efforts like upgrading of teachers' remuneration, or organization of welfare services, retirement benefits, improvement of promotion prospects, conditions of work and service, as suggested by the Education Commission (1964-66, pp. 84-116), are needed to raise the economic, social and professional status of teachers.

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Interest Patterns of High and Low Achievers: A Comparative Study

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One hundred and eighty four-eleventh class male students from different intermediate colleges of Allahabad, high and low achievers, were classified on the basis of examination marks, i.e. total marks of High School Examination. Dr. S. Chatterji's non-language preference record was used for measuring the interests of subjects. It was found that high achievers are more interested in science and craft activities than low achievers. Low achievers are more interested in agricultural and household activities. Both groups show an almost equal interest in the areas of fine arts, literature, technical, outdoor and sports activities. Academic achievement in both the groups is not found to have any substantial relationship with the areas of interest excepting literary activities with respect to high achievers and agricultural activities with respect to low achievers.

THE INTERESTS of different people vary almost as widely as their abilities vary. An individual is properly adjusted and motivated in the field of work he is interested in, but is found to be maladjusted in an uninteresting work situation. For a proper understanding of behaviour, the study of interests is as important as that of abilities, for interests are assumed to be non-intellectual, secondary motivational determinants of behaviour. As

INTEREST PATTERNS OF HIGH AND LOW ACHIEVERS

Strong (1943) puts it, "Interest scores measure a complex of liked and disliked activities—equivalent to a condition which supplies stimulation for a particular type of behaviour. Interest scores are consequently measures of drives." Thus interest is expected to enhance the contribution in the area of goal pursuit. Cronbach (1963) observes, "The best indicator of probable success in advanced training is strong general ability plus strong interest in the field, based on a realistic image of it." The present study tries to find out the relationship between interest scores and academic achievement of high and low achievers at the higher secondary stage.

A number of studies explored the relationship between interest and achievement. Many of these studies, Gustad (1952), Melville and Federiksen (1952), Darley and Hagenah (1955), Gowan (1957), Frankel (1960), and Geist (1961) report that interests are related to academic achievement, although obtained coefficients of correlations are generally low. Diwan (1970), using Chatterji's Non-Verbal Preference Record, finds significant differences between the groups of over-normal achievers and underachievers in fine arts, agriculture, and the outdoor areas of C.N.P.R. In sports, the difference is noticed between over-normal and normal groups only. In the light of the foregoing findings it can be hypothesized :

There will be significant difference between high and low achievers in the areas of artistic, literary, outdoor and sports interests.

METHOD

Sample

The sample consisted of 184 male students (arts group) belonging to different intermediate colleges located within the jurisdiction of Allahabad Municipal Corporation. The high and low achievers were classified on the basis of examination marks *i.e.*, total marks of the High School Examination. Those who scored 60 per cent or above were grouped as high achievers, while those who scored between 33 per cent and 44 per cent were grouped as low achievers.

Test

Dr. S. Chatterjee's Non-language Preference Record (Form 962) has been used for measuring the interests of subjects. The test has been reported highly reliable and valid by the author. Reliabilities of the C.N.P.R. scale using the Kuder—Richardson formula 21 ($N = 1300$) are .85, .79, .93, .95,

.69, .86, .76, .93, .91 and .81 for F., L., Sc., M., Ag., T., C., O., Sp., and H. respectively. The concurrent validity of the test is also established.

The criterion of academic achievement were the High School Examination marks collected from the tabulation registers released by the U.P. Board to different institutions.

Results

TABLE 1

THE TABLE SHOWS THE COMPARISON OF MEANS BETWEEN
THE TWO GROUPS OF HIGH AND LOW ACHIEVERS ON
INTEREST RECORD

Areas	High Achievers $N_1=82$		Low Achievers $N_2=102$		C.R.
	Mean	S.D.	Mean	S.D.	
Fine arts	27.55	6.70	28.60	9.00	.91
Literary	28.40	7.80	27.90	6.40	.48
Scientific	34.75	9.90	28.85	10.90	3.92**
Medical	31.85	10.60	30.15	11.00	1.132
Agricultural	27.50	6.95	31.75	5.02	4.69**
Technical	23.80	7.25	25.30	7.10	1.407
Craft	27.90	6.60	24.55	6.15	3.734**
Outdoor	27.75	9.45	30.15	11.55	1.364
Sports	29.50	8.65	32.45	11.75	1.964
Household work	23.50	6.60	26.70	8.85	2.925**

**Significant at .01 level of confidence.

DISCUSSION AND CONCLUSION

Table I reveals that there exists a significant difference between the high and low-achieving groups with respect to scientific, agricultural, craft and household work scores, as the obtained C.R. values for these areas are significant at 10 per cent level of confidence. As the mean values of high achievers are higher in the areas of science and craft, they have definitely greater interest in these areas than the low achievers. As, the mean values of low achievers are higher in the areas of agriculture and household work, it seems that the low achievers are more interested in agricultural and

INTEREST PATTERNS OF HIGH AND LOW ACHIEVERS

TABLE 2
CORRELATIONS OF EXAMINATION MARKS WITH THE TEN AREAS OF
INTEREST FOR THE GROUP OF HIGH AND LOW ACHIEVERS

Areas	High Achievers	Low Achievers
	$N_1=82$ r	$N_2=102$ r
Fine Arts	.09	.07
Literary	.21*	.09
Scientific	.06	.05
Medical	.009	.01
Agricultural	.004	.20*
Technical	-.08	-.02
Crafts	-.09	-.002
Outdoor	.01	.10
Sports	.08	.07
Household work	-.11	-.02

*Significant at .05 level of confidence.

household work than the high achievers. Since there does not exist any significant difference between the mean values of high and low achievers with respect to other areas (fine arts, literature, medical, technical, outdoor, sports), the two groups may be said to have similar interests in these areas.

Table 2 shows that in the high-achieving group, correlations between technical, crafts, and household work areas of C.N.P.R. and attainment (academic achievement) are negative $-.08$, $-.09$, $-.11$ respectively. The relationship between examination marks and fine arts, science, medical, agriculture, outdoor, and sports areas of interest is negligible, except in the literary area where the obtained value 0.21 is significant at .05 per cent level of confidence. In case of low achievers, the relationship between examination marks and fine arts, technical, craft, and household work areas of C.N.P.R. is negative: $r = -.07$, $-.02$, $-.002$, $-.02$ respectively. There does not exist any substantial relationship between literary, scientific, medical, outdoor and sports areas of interest and academic achievement as the 'r' values in these areas are not significant. But the correlation between the area of agriculture and examination marks, $r = .20$, with respect to low achievers is significant at .05 per cent level of confidence. In general, the correlational discovery implies that interest in technical crafts and household pursuits does not coincide with successful studies in arts courses. The high correlation between examination marks and literary interest may be interpreted as characteristic of the academic life of arts students.

On the basis of these findings the following conclusions can be drawn :

- (a) High achievers of arts group have greater interest in science and craft activities than low achievers. Low achievers are more interested in agricultural and household activities. Both groups show an almost equal interest in the fine arts, literature, medical, technical, outdoor, and sports activities.
- (b) Academic achievement in both the groups is not found to have any substantial relationship with the areas of interest excepting literary activities.
- (c) This shows that high achievers of arts group are so because they are interested in literary activities. This is so because the course content at the Higher Secondary stage is literary in character. Low achievers are so because of their high agricultural interests, for which the courses at this stage in urban areas provide no opportunity for development.

In short, these results reflect the narrow range of interests whose development is catered to in the academic life of our students.

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A Study of the Effect of Financial Incentives on Job Satisfaction of Blue-Collar Workers*

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WIDESPREAD INTEREST in money as a motivational tool for speeding up production was first created by Fredrick Taylor (1911). He found that an energetic steel worker would "run 12 miles up a mountain-side to work on his cabin". He very rightly thought that this excess energy could be channeled for increasing production. He was confident of an increase in production as a sequel to this 'extra energy mobilization'. Later on, several scientists tried to debunk this concept of the 'Economic Man' but the idea that man is primarily motivated by money, however, persisted, the reasons being that it is partly true. It is a fact that in every society there are persons who are motivated primarily by the desire to make money and therefore they respond to financial incentives in a direct, positive and predictable manner.

In economically prosperous countries where wages are high and employment opportunities better, money acquires secondary significance. The wages are always sufficient to satisfy the primary needs. But in a

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country like India, where job opportunities are scarce and the wage-level is none too high, where actually a considerable proportion of the population subsists below the poverty-line, wages and financial returns acquire primary significance. It is in this context that the 'security-wages nexus' has been considered of the utmost importance in case of the Indian worker in general and blue-collar workers in particular. Under these circumstances, it is a judicious surmise that financial incentives would exercise a positive influence on the job satisfaction of industrial workers. The present study was conducted to study this influence on job satisfaction of blue-collar workers.

Mayo's investigations unravelled a number of facts about work life which were completely contradictory to Taylor's theory of the 'Economic Man'. It was found that work is not an isolated happening; rather it is a social phenomenon. The work group exercises vital controls over the workers' behaviour. It was also found that job-life offers many satisfactions other than money. A worker's reactions are not governed exclusively by the formal organizational group; superimposed upon the formal group is the informal work group which to a great extent determines the worker's behaviour on the job.

It is now recognized that the work-environment satisfies a number of needs of an individual worker. Maslow (1943) enumerated eight such needs which he arranged in a rank-order. The extent to which the total job-environment or the various segments of the job environment contribute to the satisfaction of these needs determines the job satisfaction of workers.

The term 'job satisfaction' has been widely used and various interpretations have been given to it. Hoppock (1935) was the first industrial psychologist to give this word a logical definition. Some psychologists (Blum and Naylor, 1968) believe that job satisfaction is the result of various attitudes possessed by the employee which relate to the job and are concerned with several specific job aspects.

In a later review of literature concerning job satisfaction (Pestonjee, 1973) it was concluded that job satisfaction can be taken as a summation of employees' feelings in four important areas. Two of these (job and management) encompass factors directly concerned with the job (intrinsic factors) and the remaining two (social relations and personal adjustment) include factors not directly connected with the job but which are presumed to have a bearing on job satisfaction.

In one of their comparatively recent papers, Sinha and Agarwal (1971) defined job satisfaction as "a persistent effective state which has arisen in the individual as a function of the perceived characteristics of his job in relation to his frame of reference".

Weitz (1952) also supports the above belief. He observes that job

satisfaction should be interpreted in the light of general satisfaction index. The worker with a high general dissatisfaction score is less likely to quit his job than one with a low score, even though both have a large number of specific job dissatisfactions.

The term 'job satisfaction' has often been confused with morale and job attitudes. Some psychologists have used the two terms 'job satisfaction' and 'morale' as synonyms while others have discriminated between the two. Crites (1969) has attempted to analyze the nature of these concepts. According to him, "... If it is some specific aspect of the job such as duties and tasks or working conditions, the concept which is defined, would be job attitudes. If it is the overall job in which the individual is presently employed, then the concept would be job satisfaction. . . And if the referent includes the work group and/or employing organization, as well as job or vocational satisfaction, the concept would be morale."

The problem of *specificity* vs. *generality* of job satisfaction has also been discussed by Vroom (1964). He equates job satisfaction with the valence of the job or work role. The overall valence of work role is useful in predicting behaviour in relation to the total work role. Some investigators (French, Kornhauser and Marrow, 1946; Smith, 1955; Vroom, 1964) have underlined the need to study specific aspects of job-life to arrive at a satisfactory index of job satisfaction.

There have been a number of studies to find out different correlates and factors of job satisfaction. Several factors of job satisfaction emerge from different factor-analytic studies (Hoppock, 1935; Worthy, 1950 a, b; Grove and Kerr, 1951; Morse, 1953;). Many writers (Kristy, 1954, Heson, 1954 c) have emphasized the importance of the job itself in determining job satisfaction. Siegel (1962, pp. 285-295), on the basis of his review of job satisfaction studies, comes to the conclusion that all the results may be conveniently grouped under two headings on the basis of their pertinence to the following factors: "(i) intrinsic and (ii) extrinsic to the job itself". Factors intrinsic to the job include pay, job security, participation and personal recognition, hours, working conditions and occupational status. Among factors extrinsic to the job perceptions are supervision, sex, age, level of intelligence, job experience or length of service and personal adjustment. Herzberg and his associates (1957), in their review of job attitude studies revealed ten major factors constituting job satisfaction with nearly 150 specific aspects. The major factors are (i) intrinsic aspects of the job, (ii) supervision, (iii) working conditions, (iv) wages, (v) opportunity for advancement, (vi) security, (vii) company and management, (viii) social aspects of the job (ix) communication, and (x) benefits. Tiffin and McCormick (1962) believe that to understand human behaviour, it is

always desirable to have some idea about "the sets of values by which people live, and about the satisfactions associated with the type of work they do".

Many researchers have brought to light the fact that the satisfied personality differs in certain vital respects from the dissatisfied personality. First, the studies were directed towards the relationship between personality traits or abilities and attitudes and then shifted from abilities and traits to unconscious needs and conflicts.

Some investigators have attempted to provide a mathematical model of job satisfaction known as the *subtractive approach*. They believe that job satisfaction is a function of the difference between the amount of some outcome provided by a work role and the strength of a related desire or motive on the part of the person. Job satisfaction is determined to a large extent by perception and expectations. For perfect job satisfaction, there should exist a one to one relationship between the perception of how well the job-life fulfils the various needs and expectations and the aspirations of the individual regarding the extent to which these needs should have been fulfilled. Any discrepancy between aspirations and perceptions accounts for dissatisfaction.

Herzberg, Mausner and Snyderman (1957), in their famous study of job satisfaction and dissatisfaction of middle management, engineers and accountants, used the *critical incident technique*. Herzberg's dichotomous approach reveals that all the factors affecting job satisfaction can be classified into two categories—satisfiers and dissatisfiers. The satisfiers or job content factors or motivators are those which, when present, lead to job satisfaction. Dissatisfiers, variously named as job context factors or hygiene factors, when absent, lead to job dissatisfaction. Many later researches on Herzberg's model have not used the critical incident technique.

Vroom (1964) has criticized these approaches by saying that "the two approaches to the analysis of conditions affecting job satisfaction... are based on the assumption that it is possible to explain data on job satisfaction either by looking at the nature of his work role or... his personality" (p. 161). He asserts that explanation of satisfaction requires the use of both work role and personality variables. These two sets of variables have been found interacting with each other. Any study of job satisfaction should include both these sets of variables. In this theory, the satisfaction that an individual derives from a work role, or more precisely the "valence of a work role to its occupants is assumed to be a function not only of the objective properties of that work role but also of the motives of the individual" (p. 162). This model has been variously called 'multiplicative

or 'interactional' (Vroom, 1960 a). In other words, according to this model, "The valence of a job is a monotonically increasing function of the algebraic sum of the products of the valence of other outcomes and the cognized instrumentality of the job for the attainment of these outcomes" (Vroom, 1964, p. 163).

As early as in 1931, Fisher and Hanna proposed that dissatisfaction stems largely from emotional maladjustment. Smith (1955) also observed that many persons assume that job satisfaction is primarily affected by personal maladjustment. Several other studies show only a slight relationship between neurotic tendencies and reports of dissatisfaction (McMurray, 1932; Hoppock, 1935).

Brophy (1959) classified theories of job satisfaction into four types—need, expectation, role and self.

The need theory was proposed by Morse (1953). According to this, a worker's satisfaction depends upon the function of two factors: "how much his needs are fulfilled by being in a particular situation" and "how much his needs remain unfulfilled". Thus, for calculating the amount of satisfaction the following equation may be used:

$$S = f(T_1 - T_2) - T_2;$$

Where

S = Satisfaction

T_1 = Worker's initial tension level

T_2 = Tension level after being exposed to the vocation.

The second type of theory is based upon the hypothesis that "an individual's degree of satisfaction with an activity leading towards a goal is an inverse function of the level of his perceived probability of attaining the goal both in a situation when the goal is attained and in a situation when it is not attained" (p. 270). Katzell's (1964) theory is based on this model.

There are two role theories—sociological and psychological. The characteristics of the sociological theory are (1) It involves an evaluation of the environment from a viewpoint external to the individual rather than from his own phenomenological frame of reference; (2) It considers an aggregate of the individual positions as a single position and (3) It focuses on people, in general, within the broadly defined position and their expectations, rather than upon a single person and his interaction with the environment (Brophy, 1969, p. 272).

According to the self theory, vocational satisfaction is a function of agreement among the worker's self-concepts, both real and ideal, and the occupational roles he perceives or plays in the world of work.

"The question of wage policy is of great concern to labour, management

and government. Of all the problems that face the worker, that of wages is the most pressing and persistent" (V.V. Giri, 1958, p. 215). When the third session of the Asian Regional Labour Conference of the I.L.O. was held in Tokyo in 1953, it was concluded that the objective of government as well as that of employers and workers should be to establish wages at the highest possible level consistent with the economic condition of a country and that such wages should represent a share of the increased prosperity resulting from the economic development of the country as a whole.

Wages satisfy human needs and thus are a vital motivating agent. Vroom (1964) has not treated the problem of job satisfaction separately from that of job motivation. Herzberg (1959) has used the term 'job motivation' as a synonym for 'job satisfaction'. We may posit that satisfaction and motivation, in the context of industrial behaviour, are the same.

Sometimes motivating workers becomes a problem because for a large number of people, the work has ceased to give satisfaction. Several people work to earn more and not because they derive any pleasure from it. Sud (1972) observes that need for motivating workers arises because of the following reasons:

1. The employee's usual remuneration may be insufficient for his paramount needs.
2. The remuneration may be incommensurate with the work effort required of the employee.
3. The employee may be expected to perform his tasks in a way which prevents him from deriving adequate satisfaction from other activities.

According to Brown (1969), "an incentive is an objective goal which is capable of satisfying what we are aware of subjectively as a need, drive or desire" (p. 199). Incentives can be of two types, positive and negative. Positive incentives (e.g. material rewards, praise, anticipated success, etc.) are those which facilitate or promote a particular form of behaviour. Negative incentives inhibit or hamper response of one kind or another. These incentives can further be classified into three categories.

1. *Financial Incentives* : Financial incentives help the employee or a group of employees in getting reward through increased payment or financial benefits. Indirect financial incentives relate specifically to the employee's individual work effort rather than to his group contribution. Direct financial incentives are those which reward the

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employee for his increased output by monetary compensation, generally in cash, at a level above his usual remuneration.

2. *Semi-Financial Incentives:* Semi-financial incentives like well-planned promotion policies, provision of subsidized canteens and other amenities and pension schemes are related to indirect financial benefits.
3. *Non-Financial Incentives:* These are generally directed at improvement of management policies, working facilities, company morale, employee communication, etc. These impartially compensate the workers through the provision of welfare schemes, recreational facilities and other benefits which do not involve direct monetary payment (Sud, 1972).

Opsahl and Dunnette (1966) have listed the following five theories which attempt to explain the effect of money on job performance:

1. Money as a generalized conditioned reinforcer.
2. Money as a conditioned incentive.
3. Money as an anxiety reducer.
4. Money as a hygiene factor.
5. Money as a means of instrumentality.

The success of any incentive plan depends upon employee acceptance. All the incentive plans can be classified into three groups: cash, deferred and combination. Essentially there are only two methods of wage payment. One is to pay for the amount of time the worker spends on the job or the input of time into the job, the other is to pay for the amount of goods and services produced, or the output from the job.

It was the Fair Wages Committee (established in 1948) which for the first time classified in detail the various wage concepts and their application to Indian conditions. At that time three broad wage concepts, viz. 'living wage', 'fair wage' and 'minimum wage' were defined. The principle of 'equal pay for equal work' was recognized by the Constitution. On the basis of the report made by the Fair Wages Committee, the Fair Wages Bill was introduced by the Central Government in 1950. In the first five-year Plan also the importance of wage policy was stressed.

By the end of the first five-year Plan, several changes started taking place. The prices went up and as a result labour unions claimed a 25 per cent increase in wages. Several recommendations for increasing productivity like introduction of payment by results, rationalization, etc. were made. At the time of the second five-year Plan, the second Pay Commis-

sion was appointed. The main effect of these policies on the economy was that they prevented any excessive wage increases. From 1961 onwards, for the first four years of the third Plan, real earnings did not advance as compared to the second Plan.

In spite of several limitations, a number of incentive systems have been suggested and the use of such systems has grown. The principal objective of the introduction of a wage incentive plan is to offer some sort of inducement to a worker or a group of workers for higher output. Thus, the workers are encouraged to augment productivity of their unit by establishing, more or less, a direct relationship between output and earnings.

In most of the studies of incentives, financial incentives have been found to be the most effective determinant of job satisfaction. According to some authors (Blum, 1956; Blum and Naylor, 1968) its effect has been overemphasized. But it is true that money is a very strong motivator, especially in case of Indian workers. Maier (1965) rightly avers that in itself, money does not have any incentive value. Our economic structure has made it a medium of exchange and, therefore, it can be used to obtain the real incentives. The exchange value of money has become so ingrained in human beings that they sometimes appear to be seeking money for its own sake rather than for what it represents. Whyte (1955) does not have any doubt regarding money having an important effect on the thinking and behaviour of workers. But he says that this effect is neither as simple nor as strong as managements have often assumed. As a matter of fact, financial incentives become quickly linked to a lot of other motives that have little or nothing to do with money. Some investigators who tried to condemn the money myth could not succeed, owing to the fact that it is partly true. Many persons are motivated primarily by the desire to make money, which for them takes precedence over all other considerations including such niceties as the opinions of one's peers. While examining financial incentives and its relations with other needs, Whyte (1955) reached the conclusion that power is, perhaps the most important motivational tool. As power may be gained with the help of money, money can be accepted to be one of the most important sources of satisfaction.

The present study was carried out in a leading factory of Varanasi, Deisel Locomotive Works, Varanasi, makes broad gauge engines. The D.L.W. locomotives, built on designs supplied by Alco Products, are meant to attain a maximum speed of 100 kilometres an hour, hauling a set of 13 carriages. In spite of its impressive performance in 1970, this factory had not been able to attain the original target of 150 broad gauge diesel electric locomotives or their equivalent per annum in the final phase of development with fully established incentive working. The expected production

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figures for 1971-72 were 65 BG and 40 MG locomotives. But project managers thought that the original target would be achieved in 1973-74. During 1970-71, locomotive production from D.L.W. was as under :

	<i>Production 1970-71</i>	<i>Cumulative</i>
Broad Gauge Main Line		
Locomotive Type WDM 2	57	357
Metre Gauge Main Line		
Locomotives Type YDM 4	11	45
Total :	68	402

After a long discussion between the Railway Board and the D.L.W. administration, it was decided that the Incentive Bonus Scheme should be introduced in D.L.W. in 1967 but due to some reasons it could not be introduced till May, 1969. In this scheme, time was the yardstick for measuring the work and productivity. The basic wages of all workers and supervisors were guaranteed irrespective of the incentive scheme.

The present investigation began with a pilot study conducted to check if the Herzbergian model of job motivation was workable on the sample of the research reported here. An investigation using the semi-projective technique was conducted on 150 blue-collar workers. These workers were divided into two groups—the experimental group which included workers working under the financial incentive scheme and a matched control group. The null hypothesis formulated for this study was that the job satisfaction of a group of workers working under a financial incentive scheme was the same as that of a group of workers who were not working under such a scheme. The workers were contacted individually and were asked to answer the following questions on a sheet of paper : (1) When did you join ? (2) What aspects of the job do you like ? (3) What aspects of the job do you dislike ? (4) How do you find your job conditions ?

The responses to these four questions were content-analyzed. Both the experimental and the control group considered the factor of wages or salary to be a dissatisfier but the importance of the same varied from one group to another. In a list of eight dissatisfiers, it was given fourth position by the control group while by the experimental group it was ranked third. But, on the whole, very inconsistent results were obtained. This led to the conclusion that the critical incident technique could not be applied satisfactorily in this case (Pestonjee, Akhtar, and Dwivedi, 1971). In the face of these difficulties the Herzbergian approach was given up and it was substituted by the multiplicative model.

Hypotheses

Five null hypotheses were formulated for the present study. They are as follows :

1. The job satisfaction of a group of workers, working under the Financial Incentive Scheme, is the same as that of workers not working under such a scheme.
2. The satisfaction of a group of workers working under the Financial Incentive Scheme, with the management, is the same as that of workers not working under such a scheme.

Sample

In the present investigation the 'matched group method' was adopted. Two matched groups, similar in terms of age, number of dependents, tenure of service, working hours and productivity were selected for the purpose. The average age of workers in the experimental group (N=240) was 27.06 and in the control group (N=460) 27.38 years. The average length of service was found to be 6.62 years in the experimental and 6.70 in the control group. The workers of the experimental group were working under the Financial Incentive Scheme whereas the control group was not working under any such scheme. It is reasonable to posit that financial incentive is the independent variable and job satisfaction is the dependent variable.

To check against the possibility of the job task influencing job satisfaction of employees in different shops, a study of forty selected workers from two shops was conducted. Two matched groups, each consisting of twenty workers, were taken. One group was working in the mechanical shop and the other in the electrical shop. The null hypothesis that job satisfaction of the two groups will not significantly differ was tested by applying the F-ratio.

The obtained values are not significant. The analysis of results indicated that the two groups do not differ significantly in terms of their job satisfaction scores. It shows that other things being equal, the nature of task hardly affects the amount of job satisfaction.

Research Tool

An inventory standardized earlier on the interactional model was used

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(Pestonjee, 1973). The items are worded in a 'direct' manner because they are reported to have an advantage over 'indirect' items (Weitz and Nuckols, 1955). They are in Hindi and can be used on all categories of blue-collar production workers. The inventory was standardized on the basis of the multiplicative model of job satisfaction exploring a number of 'on-the-job' and 'off-the-job' factors. It assesses job satisfaction in four areas, viz. Job, Management, Social Relations and Personal Adjustment. Each area consists of 20 items. Items under the first two areas (on-the-job areas) measure satisfaction with job environment. The other two areas relate to 'off-the-job' aspects of job satisfaction. The split half reliability coefficients of the inventory are .99, .77, .98 and .98 respectively for the four areas. It was validated by the matched group technique. Percentile norms provide suitable cut-points to categorize workers as highly satisfied, moderately satisfied and dissatisfied. The inventory is easy to administer and has been found to be useful, especially with workers whose vocabulary is not very vast. The answers are in the form of 'yes or no'.

Results

The following tables show the job satisfaction scores of the two groups. The two groups have been compared in terms of mean, median, mode, S.D, Q, Q1, and Q3.

TABLE 1

Values/ Areas/ Groups	Job		Management		Social Relations		Pers. Adjustment	
	Experi- mental Group	Control Group	Experi- mental Group	Control Group	Experi- mental Group	Control Group	Experi- mental Group	Control Group
Mean	12.10	9.72	9.08	6.34	12.10	9.67	12.88	10.31
Median	12.02	9.68	8.63	4.59	12.30	9.76	13.17	10.54
Mode	11.86	9.60	7.73	1.09	12.70	9.94	13.75	11.00
SD	3.38	3.02	5.10	3.60	3.26	3.10	3.84	3.52
Q1	9.78	7.60	4.86	2.38	9.74	7.56	10.03	7.56
Q3	14.52	11.82	12.78	8.15	14.50	11.77	15.88	12.86
Q	2.37	2.11	3.97	2.89	2.35	2.11	2.93	2.65

TABLE 2

Values/ Areas/ Groups	Total Score (All the four areas combined)		'On-the-Job' Areas (Job+Management)		'Off-the-Job' Areas (Social Relations+ Personal Adjustment)	
	Experimental Group	Control Group	Experimental Group	Control Group	Experimental Group	Control Group
Mean	46.02	35.18	21.22	15.19	25.02	20.02
Median	44.50	34.82	20.85	14.58	25.38	15.86
Mode	41.46	34.10	20.14	13.34	26.10	7.60
S. D.	10.76	8.36	7.16	5.84	6.40	5.84
Q 1	38.50	29.36	16.18	10.78	20.50	15.86
Q 3	52.10	40.98	25.54	19.53	29.70	24.06
Q	6.80	5.81	4.68	4.38	4.60	2.10

TABLE 3
SIGNIFICANCE OF DIFFERENCE BETWEEN THE GROUPS

Areas	C. R.	Level of Significance
Job	9.18	Beyond .01 level
Management	7.43	beyond .01 level
Social Relations	9.53	beyond .01 level
Personal Adjustment	8.65	beyond .01 level
Total	13.62	beyond .01 level
Inside job aspects (Job and Management)	11.25	beyond .01 level
Outside job aspects (Social Relations and Personal Adjustment)	10.12	beyond .01 level

To find out the interaction between two sets of factors ('on-the-job' and 'off-the-job' factors) and between financial incentives and these factors, analysis of variance test was used. Results are presented in Table 4.

TABLE 4
TABLE OF ANALYSIS OF VARIANCE

	Ss	df	Mean Square	F	Level of Signifi- cance
Rows	11818.40	1	11818.40	79.02	.01
Columns	7172.26	1	7172.26	47.95	.01
Interaction	315.09	1	315.09	8.19	.01
Within (error)	71196.41	476	149.57	—	—

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The product moment correlation was computed to study the relationship between the four areas. Obtained coefficients are recorded in the following tables (Tables 5 and 6)

TABLE 5

INTER-AREA CORRELATIONS : EXPERIMENTAL GROUP (N=240)

	<i>Manage- ment</i>	<i>Social Rela- tions</i>	<i>Personal Adjust- ment</i>	<i>Inside Job Aspects</i>
Job	.40	.42	.39	×
Management	×	.12	.04	×
Social Relations	×	×	.60	×
Outside Job Aspects	×	×	×	.25

TABLE 6

INTER-AREA CORRELATIONS : CONTROL GROUP

N=460

	<i>Manage- ment</i>	<i>Social Rela- tions</i>	<i>Personal Adjustment</i>	<i>Inside Job Aspects</i>
Job	.44	.17	.15	×
Management	×	.11	.15	×
Social Relations	×	×	.55	×
Outside Job Aspects	×	×	×	.09

Scores obtained by the two groups on each item of the inventory were studied in terms of significance of difference by applying the Test for Proportions. Obtained values are recorded in the following tables (Tables 7 to 10).

TABLE 7
JOB AREA

<i>Item Num- ber</i>	<i>No. of positive answers: Experi- mental Group (N=240)</i>	<i>No. of positive answers: Control Group (N=460)</i>	<i>Item propor- tion value</i>	<i>Level of Signi- ficance</i>
1	182	330	1.205	N.S.
7	141	255	0.825	"
11	111	158	3.151	Beyond 1%
13	120	136	5.394	"
18	161	245	3.361	"
21	151	232	3.205	"
27	160	274	1.865	N.S.
31	92	122	3.199	Beyond 1%
33	131	151	5.710	"
38	212	357	3.821	"
47	90	158	0.842	N.S.
51	174	272	3.694	Beyond 1%
53	158	246	3.263	"
58	124	161	4.282	"
61	110	146	3.710	"
67	149	272	0.763	N.S.
71	151	233	3.500	Beyond 1%
73	166	295	1.351	N.S.
74	168	223	8.540	Beyond 1%
78	154	236	3.368	"

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TABLE 8
MANAGEMENT AREA

<i>Item Num- ber</i>	<i>No. of positive answers: Experimen- tal Group (N=240)</i>	<i>No. of positive answers: Control Group (N=460)</i>	<i>Item- propor- tion value</i>	<i>Level of Signi- ficance</i>
2	124	156	4.538	Beyond 1%
6	101	87	6.416	"
14	91	108	3.918	"
17	121	121	6.263	"
19	68	69	4.030	"
22	85	80	5.171	"
26	77	83	4.117	"
34	109	113	5.648	"
37	137	164	5.631	"
39	77	59	5.818	"
41	129	181	3.692	"
42	183	253	6.085	"
46	94	99	4.888	"
54	77	70	4.941	"
57	113	129	4.973	"
59	84	104	3.416	"
62	105	112	4.256	"
66	140	134	7.684	"
77	134	156	5.763	"
79	150	206	4.684	"

TABLE 9
SOCIAL RELATIONS AREA

<i>Item Num- ber</i>	<i>No. of positive answers: experimen- tal Group (N=240)</i>	<i>No. of positive answers: Control Group (N=460)</i>	<i>Item- propor- tion Value</i>	<i>Level of Signi- ficance</i>
3	161	252	2.510	5%
5	139	185	4.538	Beyond 1%
9	194	311	4.000	"
10	114	193	1.435	N.S.
12	161	224	4.842	Beyond 1%
15	119	170	3.230	"
23	156	241	3.368	"
25	175	295	2.472	5%
29	161	246	3.579	Beyond 1%
32	85	114	2.907	1%
35	56	55	3.677	Beyond 1%
43	180	315	1.885	N.S.
45	166	236	4.810	Beyond 1%
49	112	138	4.368	"
52	65	133	0.542	N.S.
55	186	274	5.142	Beyond 1%
65	133	212	2.384	5%
69	180	319	1.628	N.S.
72	190	347	1.121	"
75	123	233	0.153	"

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TABLE 10
PERSONAL ADJUSTMENT AREA

<i>Item Number</i>	<i>No. of positive answers: Experimental Group (N=240)</i>	<i>No. of positive answers: Control Group (N=460)</i>	<i>Item proportion value</i>	<i>Level of Significance</i>
4	132	177	4.25	Beyond 1%
8	142	240	1.79	N.S.
16	146	201	4.41	Beyond 1%
20	124	157	4.48	"
24	143	181	5.17	"
28	154	250	2.57	5%
30	178	313	1.74	N.S.
36	121	176	3.12	Beyond 1%
40	191	313	3.47	"
44	189	388	-1.80	N.S.
48	119	184	2.46	5%
50	184	398	-3.00	Beyond 1%
56	198	322	-1.21	N.S.
60	153	248	2.31	5%
63	128	119	13.15	Beyond 1%
64	93	121	3.26	"
68	167	304	0.94	N.S.
70	190	281	0.68	N.S.
76	210	337	-1.08	N.S.
80	103	103	5.56	Beyond 1%

Percentile norms were used to categorize workers as moderately satisfied and highly satisfied workers. In both the groups, these percentages were found out for all the four areas separately as well as the total inventory scores. Tables 11 and 12 show these values.

TABLE 11
CONTROL GROUP
N=460

Areas	Dissatisfied		Moderately satisfied		Highly satisfied	
	N	Percentage	N	Percentage	N	Percentage
Job	168	36.52	164	35.65	128	27.83
Management	226	49.13	192	41.73	42	9.13
Social Relations	152	33.04	183	39.78	125	27.17
Personal Adjustment	142	30.87	135	29.35	183	39.78
Total	284	61.74	113	24.56	63	13.69

TABLE 12
EXPERIMENTAL GROUP
N=240

Areas	Dissatisfied		Moderately satisfied		Highly satisfied	
	N	Percentage	N	Percentage	N	Percentage
Job	32	13.33	77	32.08	131	54.58
Management	55	22.92	104	43.33	81	33.75
Social Relations	33	13.75	65	27.08	142	59.17
Personal Adjustment	27	11.25	60	25.00	153	63.75
Total	52	21.67	70	29.17	118	49.17

DISCUSSION

In the following section the two groups have been compared in terms of their satisfaction scores in different areas.

1. *Job*: Table 1 shows that the two groups differ from each other on job area and the difference is significant at .01 level. The Q values also show that the low and high scorers of the experimental group have scored more than their counterparts in the control group. This rejects our null hypothesis and establishes that job satisfaction of the workers of the experimental group in job area is greater than the job satisfaction of the workers of the control group.

Aspects covered under the job area are nature of work (dull, dangerous

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interesting), hours of work, fellow workers, opportunities on the job for promotion and advancement (prospects), over-time regulations, interest in work, physical environment, machines and tools and wages and salary, etc. In the following section the differences between the responses of the two groups on the 20 items covered under the job area are discussed (Table 7).

(A) *Work Role* : For some people, the job itself has a positive valence, for others it does not. "Work itself has been found to be a very strong determinant of job satisfaction" (Smith, 1955; Fortune Magazine, 1947). Krech and Crutchfield (1948) and Katz (1954) have also discussed the 'deprivations' emanating from repetitive tasks due to automation and specialization. Herzberg (1968) has suggested that 'job enrichment' or vertical enlargement of the job are conducive to psychological growth of the worker. He and his associates in their study conducted in 1959 have mentioned that, frequently cited desiderata were creative or challenging work, varied work and an opportunity to do a job completely from beginning to end, (p. 61). This theme was next only to 'achievement' and 'recognition' when considered in terms of percentages of mentions. Many investigators have studied the role of work itself as a determinant of job satisfaction in different cases.

Items 18, 51, 53, 58, 61, 71 and 78 are related to the nature of work. Results show that the workers of the experimental group have responded to these items more positively than their counterparts and differences in all cases are statistically significant.

(B) *Fellow Workers* : This also is an important source of job satisfaction. Harrell (1964) asserts that it is of intermediate importance. In a study (Morse and Weiss, 1955) 80 per cent of the 401 respondents reported that even if they had enough money to live on comfortably without working, they would keep working and 31 per cent gave the reason for continuing to work as the relationships with the people with whom they worked. At the same time Pestonjee (1967) believes that "interaction between members of a work group can lead to satisfaction as well as dissatisfaction" (p. 172). Dubin (1951) believes that teams of workers "are not just a bunch of individuals huddled together in a mass. They form groups that are social entities" (p. 17). Fellow workers determine, to some extent, the attitude of the worker towards work. Ganguli's (1964) investigation on foundrymen at a government-owned engineering factory about the "relative importance of different incentive items" indicates that 'good personal relations with colleagues' is ranked ninth by the respondents.

Item numbers 11 and 38 which reveal satisfaction/dissatisfaction with co-workers very significantly differentiate the workers of the experimental

group from those of the control group. By comparing the responses of the two groups on these items it becomes apparent that the workers of the experimental group possess a more positive attitude towards 'co-workers'. Our findings support the notion that 'co-workers' are an important determinant of job satisfaction.

(C) *Wages* : The importance of wages as a determinant of job satisfaction has been discussed in the earlier section of this paper. Item number 31 of the inventory refers to satisfaction with pay. Item 64 of the Personal Adjustment Area also deals with earnings or wages. A comparison of responses of the two groups to these items leads us to believe that financial incentives have been helpful for the workers of the experimental group in being more satisfied with their pay than the workers of the control group.

(D) *Working Conditions* : Harrell (1964), after examining the findings of various investigations, has concluded that "working conditions rank variously from second to ninth in importance. There seems to be a tendency for working conditions to be ranked lower, perhaps because they have been improved" (p. 271—72). Gilmer (1966) also believes that working conditions are more important for female workers than male workers, especially for married ones.

Item 21 of the inventory refers to the 'physical environment' and item 74 to 'hours of work'. A comparison of the responses of the two groups on these items shows that the workers of the experimental group are more satisfied with the 'physical environment' of the workshop as well as their 'working hours'. Both the groups have shown equal amount of satisfaction with 'machines and tools' (item I). It is quite obvious that if the machines and tools are new and up-to-date workers find their work interesting.

(E) *Leisure and Recreation* : An increasing interest in longer weekends leads us to believe that for the industrial worker, leisure can be an opportunity for satisfying his higher order needs. Besides, he gets an opportunity to acquire skills and knowledge which promote his job potentials, strengthen family bonds, help him recuperate from the stresses of work and fatigue. 'Leisure' and 'recreation' both eliminate the feeling of boredom on the part of the workers. Workers have been found to be resting or taking part in activities designed to relieve the tensions built up on the job. Sometimes workers use this period for 'overtime work'. As these factors are important for a healthy adjustment in work-life, they may be considered to be effective factors of job satisfaction. In our investigation a comparison of the workers of the two groups reveals that the workers of the experimental group are more satisfied with the recreational opportunities as well as with overtime rules (items 13 and 33).

(F) *Participation* : If an Individual feels that he is a member of a group it means he is experiencing a sense of participation (Maier, 1965). Harrell (1964) is of the opinion that 'participation' incorporates two very strong motives, viz. self respect and social approval. Nowadays, our Government is also trying to promote worker participation.

It is evident that regarding the impact of participation on satisfaction, mixed results were obtained. Vroom (1964) conjectures that "the amount of satisfaction obtained from a given amount of influence might vary considerably with the nature of the decision, the desires of the person and the nature of the social situation in which the influence is exercised. Taking such variables into account may help explain discrepancies in findings" (p. 118).

The findings of our investigation (item 26) indicate that the workers of the experimental group consider themselves to be having a greater sense of participation than the workers of the control group. Introduction of the incentive scheme promoted the feeling of participation among members of the experimental group, who felt that their importance in the factory had been recognized by the management.

In the job area, we observe that no significant difference is obtained on items 1, 27, 47, 67 and 73 of the inventory. These items and related factors are given below :

Item Number	1	—	Machines and tools.
Item Number	27	—	Selection of job.
Item Number	47	—	Hours of work.
Item Number	67	—	Utilization of abilities.
Item Number	73	—	Uninteresting job.

We find that the workers of both the groups are equally satisfied with 'hours of work' and 'machines and tools'. All of them think that they have selected an interesting job for themselves where a complete utilization of their ability is possible.

From the above discussion, we can conclude that 'financial incentives' are conducive to increasing the job satisfaction of production workers.

(2) *Management* : Management has been found in almost all the studies to be playing an important role in the determination of job satisfaction. The major aspects covered under this area are supervisory treatment, participation, rewards and punishments, praise and blame, leave policy, favouritism etc.

If we refer to Table 1, we find that the mean differences (C.R. = 7.43) of the two groups in this area are significant at .01 level which shows that the workers of the experimental group are more satisfied with the management than the workers of the control group. Since the workers of

the experimental group were working under the incentive scheme and getting more money, they formed a more positive attitude towards the management. The Q values also show that the workers of the experimental group are more satisfied with the management than their counterparts. This rejects our second null hypothesis and confirms that the satisfaction of the workers of the experimental group with the management is greater than that of those in the control group.

In the following section, a comparative account of the responses of the two groups on different items related to management area (Table 8) is presented.

(A) *Supervisory Treatment* : In the words of Gilmer (1966), "To the workers, his supervisor is both a father figure and an irritating boss who is an equally strong contributor to both satisfaction and dissatisfaction" (p.282). He concludes that supervision seems less important at the high levels in spite of the fact that people in high positions have a greater tendency to verbalize the things that are wrong with their particular supervisory structure, highly educated workers voice criticism of their supervisors more than less educated people, and married workers with dependents are more conscious of the problem of supervision than the single man.

Like the supervisor, supervision also in an important determinant of the job satisfaction of industrial workers. It has been found to be necessary for maintaining a certain level of productivity as also group cohesion. It is the 'first-line supervisor', the forgotten man in industry, through whom the worker meets his management face to face. He affects not only the attitude of the workers but also plays an important role in the determination of morale, general happiness and efficiency of the employees in his charge. In their review of 15 studies of satisfaction and dissatisfaction, Herzberg *et. al.* (1957) found that as a satisfier supervision was mentioned only next to relationships with co-workers. It was rated fourth in the same list of job factors when considered as a source of dissatisfaction.

In our results, we observe that attitudes towards supervision and various aspect of supervisory behaviour (items 6, 14, 17, 22, 41, 42, 46, 54, 59, 66, 77 and 79) are strongly affected by the independent variable. Out of these twelve items, items 14, 54 and 77 refer to the attitudes of the management towards the workers. Items 6 and 79 are related to the nature of supervisory treatment. In other words, they find their supervisors more humble, cooperative, helpful and understanding. They think that the management has been very considerate in providing them an opportunity to earn more. At the same time, they themselves try to increase the production as much as they can, with the result that they rarely give a chance to their supervisors to scold them.

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(B) *Rewards and Punishment* : All human activities are directed towards specific goals, *i.e.* achievement of satisfaction or 'reward'. If a supervisor praises a worker for good work, the worker feels rewarded. Likewise, a worker who is blamed feels punished though such a verbal action may not accompany physical or material loss.

In the early works of the experimental psychologists an improvement in work due to 'praise' had been found. Maier (1965) believes that "praise is a form of ego satisfaction" (p-457). In factories 'punishment' is used more frequently than praise because good work is always expected of workers. 'Punishments' and 'reprimands' are also common because they are easier to proffer and they also gratify "the frustration of the supervisor" (Harrell, 1964, p. 247). But at the same time Vroom (1964) believes that if a worker expects to be praised (or criticized) for ineffective as well as effective performance, he loses all motivation.

Item 2 and 37 of the inventory refer to the 'reward and punishment' policy of the management and item 62 to the tendency of the management to praise the workers for their good performance at work. The experimental group scored higher on these items as compared to the control group. This shows that extra money in the form of incentive acts as a 'reward' for them:

(C) *Promotional Policy* : The term promotion refers to an individual's prospects in an organization. Vacancies due to retirement, resignation or expansion, are filled either by selecting a new incumbent from outside the organization or by upgrading or promoting a worker from the ranks of the organization. Herzberg *et. al.* (1957) have suggested, "the power of a promotion to increase job satisfaction is often related to feelings of growth, recognition, achievement, responsibility". (p. 62). Spector (1956) assessed the impact of promotional opportunities on job satisfaction in a laboratory situation.

A comparative study of the responses of the two groups on related items of the inventory (items 19, 34 and 39) shows that the attitudes of the experimental group towards promotional policies are more positive than those of the workers of the control group. As has been mentioned earlier, the workers of the experimental group developed an attitude of approval towards the activities of the management due to the incentive scheme. As a result of this, they hoped for fair opportunities of being promoted.

After having discussed the responses on items relating to the two 'on-the-job' areas, we shall now discuss results of responses on 'off-the-job' areas.

There is enough evidence of the fact that dissatisfaction arising from outside the job is frequently a reflection of job conditions. Studies by Sinha

and Agarwal (1971), Pestonjee (1967), Herzberg *et. al.* (1959) bear this out. Krech and Crutchfield (1948) found certain cases of industrial conflict to be maladaptive expressions of the personal frustrations of workers and managements which have little to do with conditions of work or wages. Now, in the following section, some of the important aspects of social and personal areas of satisfaction will be discussed.

(3) *Social Relations* : Gilmer (1966) believes that this is one of the most difficult job attitude factors to describe because it involves the need for belonging and social approval. A worker who feels himself to be a member of a productive, cohesive group is happier with his job than others. The social factor appears only slightly more important to women than to men; it is relatively independent of age and occupational level (p. 282).

The aspects covered under the social relations area are neighbours, friends and associates, attitudes towards people in community, participation in social activities, sociability and caste barriers, etc.

A comparison of satisfaction scores of the two groups in this area again establishes the experimental group to be better adjusted in their social life than the control group (Table 1). Q values also suggest that the low and high scorers of the experimental group have better social adjustment than their counterparts, which shows positive effect of financial returns on social adjustment of the experimental group. This is opposed to our hypothesis 3 and confirms the alternative hypothesis which states that the social relations of the workers of the experimental group are more sound than those of the workers of the control group.

The following section deals with the responses of the two groups on the items related to the social relations area (Table 9).

(A) *Attitudes Toward Community* : If an individual's social needs are satisfied by his group membership, the community will carry a positive valence for him. A job is an important cultural reality and one's adjustment to the job influences the overall adjustment. If the job provides sufficient financial returns to the individual, it becomes a source of satisfaction. Improved interpersonal relationships in work-life help in forming a positive attitude towards the 'people in community'.

This is amply illustrated by our findings. Responses on items 3, 32, 35, and 52 show that the experimental group possesses a more positive attitude towards the 'community' than the other group. This may be mainly due to the fact that workers of the experimental group had developed a healthy relationship with their co-workers.

(B) *Friends and Neighbours* : Friends and neighbours also influence one's social relations because a major part of one's leisure is spent with them. If a particular individual does not have 'difficult' acquaintances or

neighbours, his adjustment process is facilitated. Quarrelsome neighbours create mental tensions which apparently affect job satisfaction. Such mental tensions tend to lessen interest in the job which, in the long run, leads to job dissatisfaction.

Items 5, 45 and 49 refer to the relations of the workers with their friends and items 9, 25 and 29 reveal their attitudes towards their neighbours. The experimental group has shown more positive attitudes towards friends and neighbours.

(C) *Society and Social Customs* : Items 12 and 49 measure the attitudes of workers towards 'society and social customs'. Higher scores on the part of the experimental group lead us to believe that their total wages were higher than the workers of the other groups. Therefore, they could satisfy their social needs better. If an individual does not have any difficulty in solving his social problems, he is a socially adjusted individual.

(D) *Sociability* : As a trait sociability helps the individual in adjusting himself with the society; it has a positive relationship with job satisfaction. Our results show that the strength of the sociability trait in the workers of the experimental group has been affected by financial incentives. Responses of the two groups on the related items (items 23 and 55) support the above hypothesis. Enhanced financial returns, by relieving a person of social tensions and worries, develop his 'sociability' which calls for social adjustment.

(E) *Personal Adjustment* : As in other areas, in this area also the experimental group has scored significantly higher scores than the control group (Table 1). Findings in this area reject our fourth null hypothesis and indicate that the personal adjustment of the workers of the experimental group is better than the other group. Akhtar and Pestonjee (1963) found that "social adjustment is not as important in influencing adjustment 'within' work situation as personal adjustment".

The areas covered under the Personal Adjustment area are emotionality, health, home and living conditions, finances and relations with family members, etc. In the following section an item-wise comparison (Table 10) is presented.

(A) *Emotional Adjustment* : Early studies by Viteles (1932), Fisher and Hanna (1931) show that vocational maladjustment is the reflection of emotional maladjustment. They believe that emotional maladjustment breeds within the worker "dissatisfaction and thwarts him in his search for happiness and success" (Fisher and Hanna, 1931). He carries these feelings and emotions into every situation he enters and because of being ignorant of the real cause, he attributes his dissatisfaction to his work or his working situation.

Responses on items 4, 16, 20, 36, 48, 60, 70 and 80 of the inventory reveal emotional adjustment. Better scores by the experimental group show that extra money in the form of incentives has been helpful for workers to get rid of mental worries by satisfying their ego-needs (recognition, affiliation, prestige, etc.) which makes them more stable.

(B) *Home and Family*: Hersey (1932) found three categories of factors were responsible for an employee's maladjustment. These relate to work, home and the environment outside home. Hall and Locke, as early as in 1938, found that unsatisfactory home life is responsible for reduced effectiveness. Gray (1952) observes that "domestic disputes" represent one of the most common factors outside the working environment that contribute to maladjustment.

A comparison of the responses of the two groups on items 24, 28, 30, 40, 50, 56 and 76 of the inventory shows that the workers of the experimental group are more satisfied with their home and family than those of the other group. They are in a better financial condition to look after their families.

Overall Job Satisfaction: A comparison of the total job satisfaction scores (Table 2) of the two groups rejects our null hypothesis 5 and establishes that the overall job satisfaction of the workers working under the Financial Incentive Scheme is greater than that of the workers of the control group.

Satisfaction With 'On-the-job' and 'Off-the-job' Factors: When we compare the two groups on the basis of the scores obtained on 'on-the-job' areas (Job and Management) and 'off-the-job' areas (Social Relations and Personal Adjustment) we find that the satisfaction of the experimental group in both these areas is higher than that of the control group.

The above discussion leads us to believe that financial incentives play an important role in the determination of job satisfaction. Our results give support to Ganguli's (1964) contention that the economic reward security nexus is crucial in case of Indian workers in general.

When the Analysis of variance (F-Ratio) is applied interactions between the two sets of factors (i.e. 'on-the-job' and 'off-the-job' factors) and job satisfaction become evident. On the basis of the findings, it can be said that these two sets of factors and overall job satisfaction interact with each other as the F-ratio, which is 8, 19 (table-4), is significant at .01 level.

Classification of Highly Satisfied, Moderately Satisfied and Dissatisfied Workers: When we compare the percentage of workers in the 'highly satisfied', 'moderately satisfied' and 'dissatisfied' categories in the four areas separately, we find that the percentages of 'highly satisfied' workers of the experimental group are greater than those of the control group. This

holds true for the total satisfaction score also (Tables 11 and 12). This again confirms our earlier contention that higher financial returns are conducive to higher job satisfaction.

But the trend of results is not unequivocal in case of the 'moderately satisfied' workers. The number of the moderately satisfied workers of the experimental group is higher in the Management area only. Regarding overall job satisfaction score also, the experimental group consists of more 'moderately satisfied' workers than the control group. In other areas, the number of 'moderately satisfied' workers is greater in case of the control group. This shows that financial incentives do not affect the satisfaction in the Job, Social Relations and Personal Adjustment areas as much as it affects the overall job satisfaction and satisfaction with management.

A trend obverse of the 'highly satisfied' category is obtained in case of the 'dissatisfied' category (Tables 11 and 12). All these results show that in all cases the percentage of 'dissatisfied' workers is greater in case of the control group than the experimental group.

Correlational study of Areas : To determine the extent of the relationship between the four areas, the product moment correlation was computed (Tables 5 and 6). In case of the experimental group, except for the correlation between Management and Personal Adjustment all other correlations are high and significant beyond .01 level. The Management area is very much related to the other 'on-the-job' areas but not with the two 'off-the-job' areas. The two 'on-the-job' areas correlate very well with each other, so do the two 'off-the-job' areas.

In case of the control group also, there is a significant and high positive correlation between the two 'on-the-job' and 'off-the-job' areas. These two areas are mutually correlated too though the correlation is not very high.

A significant correlation between the various areas in case of the two groups clearly indicates that workers' satisfaction in one area has also been influencing the satisfaction in other areas. This supports the statement of Whyte (1955): "Monetary incentives do not exert their direct impact on job satisfaction. Rather they become entangled with so many social, personal and other motives which do not have to do anything with money".

The above discussion of results shows that all the five null hypotheses formulated for the present investigation have been rejected. The results confirm the findings of Ganguli (1964) and Pestonjee (1969, 1971) to the effect that financial incentives are conducive to positive attitudes towards different aspects of the job and enhanced job satisfaction.

CONCLUSIONS

From the results obtained in the course of the present study the following important conclusions can be drawn :

1. In case of Indian workers, job satisfaction is found to be inter-linked with financial returns.
2. Enhanced financial returns are conducive to higher satisfaction with the management, supervisory authority and practices.
3. Financial incentives positively affect the attitudes of the blue-collar workers towards work role, working conditions, fellow-workers, leisure and recreation, participation, supervisory treatment, reward-punishment/praise-blame and promotional policies of the management, society and social customs, community, friends, neighbours and family.
4. Satisfaction with job-life and satisfaction in personal and social life are related to each other. The workers who are satisfied with their work-life are also well adjusted in their personal and social life.
5. Man tries to satisfy many of his needs in and through work. Therefore in job satisfaction studies, adequate emphasis should be laid on the study of 'off-the-job' factors along with 'on-the-job' factors.
6. Friends, co-workers, members of the family and neighbours exercise their influence on the individual which, in turn, affects his job satisfaction.
7. To maintain industrial harmony, in a developing country like ours, a thorough understanding of technical as well as human resources is essential. From the findings of the present investigation, we can conclude that adequate care should be taken to enhance workers' satisfaction. Financial rewards are found to be potent resources of increasing workers' satisfaction.
8. In every occupational group, there are always a few persons who respond to the financial incentives in a direct, positive and predictable fashion. There is a need for studying the job satisfaction in relation to financial returns in the present socio-cultural context. It is reasonable to assume that this problem has greater relevance in our context than in the context of more developed countries.

□

Intra-Individual Inconsistency and 'Theory' vs. 'Behaviour-Oriented' Statements

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ONE may affirm or deny something in response to a questionnaire but may behave quite differently in actual life situations; this has been supported by Thurstone (1959) who held that "attitudes are essentially subjective experiences which may or may not conform with overt action". Likewise, a brahmin may make others believe that he favours abolition of untouchability while trying to avoid accepting even a glass of water from an office peon, a Harijan. Contrarily, a caste Hindu shoe manufacturer may invite a leather-dealer for a cup of tea in his house without any hitch. Thus, it seems that there is no simple and perfect correspondence between attitude and behaviour.

Historically, attitude has been defined over a vast conceptual territory. Allport (1935) emphasized it as 'state of readiness' while Campbell (1950) stressed on 'consistency in response to social attitudes'. Others regarded it as approach or avoidance tendencies (especially towards Jews, Negroes etc.) subject to well known laws of conditioning and reinforcement (Mc Guire 1968). In the words of Newcomb, Turner. Converse (1965),

"To say that attitudes help determine behaviour in the situation is not to say that attitudes are original causes of behaviour in any sense". Abelson (1972) in his article, "Are attitudes necessary?" prefers to "think of attitudes and behaviour as being two separate conceptual entities, each deserving scrutiny". According to him, the two "tracks do not always seem to be parallel". It appears that behaviour is a product not only of attitudes but the immediate situation as well and attitudes relevant to a situation are often multiple.

A few examples of attitude-behaviour discrepancy from the past literature will reveal that a high correlation between questionnaire responses and overt behaviour is a controversial issue.

De Fleur and Wastic (1958) observed that out of the subjects who indicated their consent to being photographed in close social relationships with Negroes and stated that 'they would not mind', over one-third refused to fulfil the prescribed action when the situation was actually presented. In another study by Linn (1965) many women were quite surprised and agitated when they found they were unable to behave as liberally as they thought they should. Contrary to these instance, Kutner, Wilkins and Yarrow (1952) found that not one of eleven restaurants would make reservations for a mixed party of Whites and Negroes, although the very same establishments had earlier served without delay or unpleasantness two White women and a Negro companion.

The White members of a labour union that had a record of promoting job equality for Negroes were reported by Lohmand and Reitzes (1954) to have organized themselves to prevent Negroes from purchasing property in their neighbourhood. Similarly Davidson and Valins (1969) produced increased shock tolerance without changes in reported painfulness of the shocks. In recent studies of "bystander effects" by Latane and Darley (1970) subjects were found with great frequency to be unable to bring themselves to help victims in ambiguous distress situations despite strong internal feelings that perhaps they ought to. On the other hand, the same researchers reported a direct relationship between what people say and what they do. Frost (1961) pointed out that local politicians do in fact utilize strategies in the campaigns which they have previously stated to be effective. Empey and Erickson (1963) have shown that self-reports of police contacts made by juveniles are highly accurate when actual police records are checked. All these results would mean to support a "postulate of consistency".

Summarizing the literature dealing with the relationship between attitudes and behaviour, Wicker (1969) ;

- (i) observed general agreement among researchers that situational variables are important and need to be considered when one is studying such a relationship.
- (ii) documented the paucity of research which, in fact, includes any consideration of the impact of various situational variables on attitude-behaviour relationship.

The present investigation will discuss as to how far an individual is inconsistent in endorsing the two types of statements *viz.* 'theory-oriented' and 'behaviour-oriented', despite their little or negligible attitudinal position (*i. e.* scale value) along the 'unfavourable-favourable' attitude continuing for abolishing untouchability.

At first, 20 persons were randomly selected to identify 'theory-oriented' and 'behaviour-oriented' statements of the Thurstone attitude scale. Their judgments revealed 9 statements 'behaviour-oriented', 12 'theory-oriented' and the rest 6 'ambiguous'. For the present investigation, only 12 statements were finally chosen in such a manner that the attitudinal positions (scale values) of six theory-oriented statements were almost matching with those of the other six behaviour-oriented ones (as shown in Table I) excluding the remaining fifteen statements (shown in appendix).

The analysis of such 'Theory' and 'Behaviour-oriented' statements, endorsed by the favourable and non-favourable groups (Table 2) and based on 20% random cases, led to the following observations :

1. All the groups, except non-favourable panda-priests and favourable scheduled caste people, endorsed higher percentage (60%) of Theory-oriented statements compared to Behaviour-oriented ones (40%). No difference in this trend was observed even if both the groups (favourable and non-favourable) were combined together. The reason for such variation (60 : 40) in endorsing 'Theory' and 'Behaviour-oriented' statements may be attributed to their rationalized wishful thinking probably under pressure of legal prohibition rather than honest acceptance of what they would have done given the practical life situations of the inter-personal relationships towards untouchables.

2. The exceptional cases of pandas, priest and scheduled caste groups are much different from the above general trend (60 : 40). The favourable scheduled caste group is quite consistent showing no difference (50 : 50) in their endorsements probably because they are strongly in favour of abolishing untouchability for the sake of their own interests. Contrary to the general trend, panda-priest groups have surpassed in endorsing more behaviour-oriented statements (63 : 64 ; 58.56 and 57.30) than the theory-oriented ones (36.36, 41.44 and 42.70) most probably because of their

TABLE 1
THEORY VS. BEHAVIOUR-ORIENTED ATTITUDE STATEMENTS* MATCHED ACCORDING TO SCALE
VALUES AFTER BEING EVALUATED BY 20 PERSONS

S. No.	Text of the attitude statements	Type of attitude : statements	Scale : Values
(A) Unfavourable			
1.	I shall not accompany an untouchable for a walk even if he lives cleaner than myself.	Behaviour	0.68
2.	Man can attain salvation by keeping faith in the observance of untouchability.	Theory	0.90
3.	I am not prepared to live in a house where an untouchable lives in the neighbourhood.	Behaviour	1.65
4.	The Government desires to spoil our religion by recruiting untouchables as waterman at the stations.	Theory	1.30
5.	If I wish to take milk/tea, I shall visit only that shop where untouchables are not allowed to enter.	Behaviour	2.50
6.	No one has the right to question, the observance of untouchability being a religious issue.	Theory	2.20
(B) Favourable			
1.	I shall be sorry if some one refuses to take the food on the grounds that it has been touched by a person called 'untouchable'.	Behaviour	6.90
2.	Regardless of a Brahmin or a Bhangi (i.e. a scavenger), persons of all occupations should be set at liberty to visit (enter) the public places.	Theory	6.60
3.	If there is some house for sale in a Harijan colony and I need to purchase one, I would purchase it for my living.	Behaviour	7.50
4.	It is not proper for the educated people to harbour prejudicial notions against the untouchables.	Theory	7.20
5.	I would welcome the marriage proposal of my daughter/sister, if someone suggests a suitable untouchable match (boy).	Behaviour	8.35
6.	To cooperate in social reform by donating for the upliftment of untouchables is a pious deed.	Theory	8.10

* The remaining 15 statements have been shown in the 'Appendix'.

TABLE 2
PERCENT OF 'THEORY-ORIENTED' AND 'BEHAVIOUR-ORIENTED' STATEMENTS ENDORSED BY
FAVOURABLE AND NON-FAVOURABLE GROUPS (BASED ON 20 RANDOM CASES
CHOSEN FROM EACH GROUP)

CHOSEN FROM EACH GROUP

S. No.	Category of Respondents	Favourable group		Non-favourable group		Favourable and Non-favourable Combined			
		% of Statements		% of Statements		% of Statements			
		N. THEORY	BEHAVIOUR	N. THEORY	BEHAVIOUR	THEORY	BEHAVIOUR		
(A) MATHURA:									
1.	All Students	54	62.76	37.24	26	59.84	40.16	61.88	38.12
2.	Occupational (upper level)	80	61.56	38.44	40	59.62	40.38	60.92	39.08
3.	(Lower "	54	59.70	43.05	46	59.86	40.14	58.20	41.80
4.	" (both combined)	134	59.64	40.36	86	58.92	41.08	59.21	40.79
5.	All Males (urban)	142	61.29	38.71	98	69.94	30.06	59.88	40.12
6.	Females "	52	61.01	38.99	32	61.39	38.61	61.15	38.85
7.	Males & Females (urban)	194	61.21	38.79	130	58.95	41.05	60.19	39.81
8.	" " (rural)	40	58.16	41.48	40	53.13	46.87	55.92	44.08
9.	Scheduled Castes	78	50.00	50.00	2	45.46	54.54	49.02	50.08
10.	Panda-priests	4	36.36	63.64	16	42.70	57.30	41.44	58.56
(B) VARANASI:									
	All people	86	58.11	41.89	54	60.61	39.39	59.00	41.00
(C) DELHI:									
	All people	107	63.25	36.75	33	65.99	34.01	63.83	36.17

strong religious background in favour of practising untouchability within and outside their family circles.

3. The non-favourable rural group like scheduled castes do not show any material difference in endorsing 'theory-oriented' (53.13) and 'behaviour-oriented' (46 : 87) statements, perhaps because of their relative simplicity, more truthful nature and general ignorance about the consequences of violating the untouchability laws.

4. Students, the occupational and the urban male-female (combined) groups too do not differ much among themselves in their general trend (60 : 40) thus showing homogeneity (*i.e.* inconsistency) in their attitudes. Likewise, the 'favourable' male and female groups do not differ in their general trend. But the 'non-favourable' urban males have endorsed the highest percentage (69.94) of 'theory-oriented' statements indicating highest inconsistency compared to their counterpart female group (61.39) which is perhaps more simple than the males, besides being less exposed to outside environment.

5. As regards the endorsements of 'behaviour-oriented' statements, the urban non-favourable Mathura (male) group is the lowest (30.06), whereas the rural (non-favourable) male-female group is the highest (48.87) showing thereby less inconsistency than the former. In between these two extremes is the non-favourable Delhi group (34.01). Also, there is no difference in the trends of endorsing the two types of statements so far as Mathura and Varanasi people are concerned except Panda-priests, scheduled caste and non-favourable rural groups of Mathura.

6. Considering the different combined groups (favourable and non-favourable) the scheduled caste group showed the least inconsistency (50.08 and 49.02) and the Delhi people the highest (36 : 17 and 63.83). There is thus hardly any difference between the favourable and non-favourable groups of Varanasi and Delhi indicating the general trend.

Following conclusions may be drawn from the above analysis of the endorsed statements by the different groups:

1. The general trend of intra-individual inconsistency (60 : 40) between 'theory-oriented' and 'behaviour-oriented' statements may be attributed to the non-favourable phenomenon towards abolishing untouchability.
2. The exceptional case of non-favourable Panda-priest with reverse direction of intra-individual inconsistency (40 : 60) between 'theory' and 'behaviour-oriented' statements may be attributed to their strong religious background in favour of practising untouchability in all possible ways.

3. Among the scheduled caste group, the absence of any intra-individual inconsistency may be ascribed to their own strong desire for abolition of untouchability practices in any form so as to ameliorate their own suppressed and depressed socio-economic status in the Hindu social organization.
4. Intra-individual inconsistency phenomenon seems to be positively related to more urbanized and industrially developed places, since intra-individual inconsistency is less observed among the rural people compared to urban people.
5. Homogeneity in intra-individual inconsistency is observed among the students, the occupational group and urban people probably because of the 'ambivalent' immature attitudes of the students and exposure to outside environment in other cases.
6. The higher intra-individual inconsistency among urban males compared to their counterpart female group may be attributed to the sex characteristics of females themselves who seem to be more simple and honest in nature and less exposed to the outside world.

APPENDIX

'BEHAVIOUR-ORIENTED', 'THEORY-ORIENTED' AND AMBIGUOUS (DOUBTFUL) ATTITUDE STATEMENTS, EVALUATED BY 20 PERSONS (FIGURES IN BRACKETS INDICATE SCALE VALUES)*

(A) *Behaviour-Oriented :*

1. I shall oppose the scavengers if they are allowed to enter our local temple (1.90).
2. I would avoid sitting beside an untouchable in a bus/train as far as possible. (2.85).
3. If I own a house, I shall not let it to an untouchable, even if it remains vacant. (3.52).

(B) *Theory-Oriented :*

4. The mere force of law cannot eradicate untouchability (4.30).
5. The caste-system has come in the way of national unity (5.90).
6. If untouchables are denied proper opportunity, our country shall be deprived of the valuable contributions which some of them might be capable of making (6.20).
7. Untouchability is inconsistent with the laws of ethics (5.50).
8. To regard scavengers as human beings is a foolishness, (0.30).
9. The practice of untouchability is a serious offence against humanity (8.75).

(C) *Ambiguous (Doubtful, Nature) :*

10. There should be liberty to practice untouchability if one so desires (3.85).

* A statement is *unfavourable* if its scale value is below 5.00, *favourable* if above 5.00, and *ambiguous* if around 5.00, towards abolishing untouchability.

11. There should be no objection in associating with the untouchables if they live clean and tidy. (5.25).
12. All feel hesitancy in associating with a dirty person regardless of his caste (4.50).
13. The use of scientific methods in most of the occupations undertaken by the untouchables, shall be helpful in abolishing untouchability (4.80).
14. The laws of untouchability obstruct our individual liberty (3.30).
15. Whosoever practices untouchability should be deprived of the election rights.

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Effects of Coaching and Practice on Intelligence and Aptitude Test Performance

A Survey of Studies

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A large number of studies are known to have been conducted to understand the effect of practice and coaching on the scores the students earn in scholastic aptitude tests. Results of these studies almost invariably point out that students who have received coaching or have taken an aptitude test earlier are likely to earn high scores on subsequent administration of the same or a similar test. This was viewed with concern by psychologists dealing with selection and allocation at schools. The problem was all the more serious because every student did not have the same advantage in coaching and/or practice. This inequality in test-familiarity among students was thought to defeat the very purpose of using aptitude tests in educational selections. Consequently, public opinion (particularly in the U.K.) became severely critical about the school-psychologists for "recommending such devices (i.e. aptitude tests) to local educational authorities instead of trusting the common sense of the practical teacher" (Burt, 1954). Another factor that contributed to this disenchantment with aptitude tests was the difficulty experienced in assessing the actual improvement brought about by remedial teaching. If coaching and/or practice shows an 'undue carry-over' from

one test to another, how should one ascertain that the gain in test scores (which is usually accepted as the criterion for evaluating the effectiveness of all methods of remedial teaching, is purely a result of remedial teaching?

The situation produced a spurt of research related to the effects of coaching and practice on intelligence and aptitude test performance. A symposium was also organized to evolve a general principle for tackling the problem. A review of some of the important studies and the symposium, as attempted in this paper, would reveal that the problem is more complex than it appears. It would also be evident that a satisfactory solution to the problem cannot be arrived at unless some particular points pertaining to coaching and practice are clarified.

THE EARLIER INVESTIGATIONS

The problem drew the attention of test-constructors in the earlier part of this century. The manuals of some well-known tests are found to have dealt with the reliability of the tests by the re-test method. Terman and Merrill (1937), for example, reported that a 'small effect' would 'persist for several months' when the test was repeated and that the 'practice effect' would become 'more or less a serious matter' when subjects took the test several times. Their study did not, however, reveal any relation between the initial level of the I.Q. and the magnitude of increase in test-scores. But the study indicated that the amount of increase varied according to the age of the subjects. For the age-group 2-2½ years the 'mean increase in I.Q. on second test' was 2.6 and for the age group 17-18 years, the corresponding gain was 4.0. Otis (1922) reported an average gain of four points owing to practice. The result was true for both the Intermediate and the Higher forms of his Self-Administering Test of Mental Ability.

McIntosh (1944) administered the same test to a group on six occasions at weekly intervals and observed that the difference in the mean I.Q.'s of the group in the first two administrations was statistically significant. The subsequent administrations did not, however, produce any significant increase in the mean I.Q. of the group. Like Terman and Merrill, he, too, did not observe any relation between the level of ability and the magnitude of gain resulting from practice. Rodger (1936) noted that brighter students gained more from practice than average and dull students. Rodger administered the Moray House Test six times to 95 students at fortnightly intervals. The average gain per test was found to be different at different levels of I.Q. For children with the I.Q. of 80, the gain was 'half a point' and for those with I.Q.'s 100 and 120, the corresponding figures were 'one point' and 'one and a half point' respectively. The total increase in I.Q. at the end of the sixth administration was also found to

be quite high. The average gain was ten points and the largest gain recorded was 24 points. Rodger did not find any relation between age and gain in I.Q. But it should be noted that his sample included subjects of two age-groups only—11 and 12 years.

Vernon (1938) in his study of the effect of test-sophistication used two tests—verbal and non-verbal. The experimental groups were made test-sophisticated by means of lectures, practical test work and experiments. Subjects in the control group took the tests at an interval of six weeks. Results indicated that in the non-verbal test the average increase in score for the experimental group was 11 points whereas in the verbal test the corresponding increase was only 4-7 points.

The results of the two tests, when combined and expressed in comparable units, showed an increase of 11.3 per cent. The control group, on the contrary, recorded a slight decrease in test-scores, although this difference was statistically insignificant. The improvement in score attained by the experimental group was attributed to test-sophistication. Two other important findings were reported by Vernon. One was the relation between sex and the magnitude of gain in test-scores. In both the tests (verbal and non-verbal) males of the experimental group improved their scores by 14-15 per cent, while the females recorded an increase of about 8 per cent. The other finding was the negative correlation between the level of I.Q. and the gain in score. Subjects with the lowest initial scores recorded the maximum gain and those with the highest initial scores showed the minimum gain.

Dave (1938) tried to understand the effect of practice on different test-items. Results of his investigation showed that scores in items related to spatial classification and spatial analogy increased by 47 per cent and 26 per cent respectively. Equation test-scores increased by 11 per cent. And among the verbal items, scores in the synonym-antonym test were found to improve the most and those in the comprehension test the least. The exact percentages of improvement were 34 and 7 respectively. Dave also noted that, on the whole, scores in non-verbal tests improved more than those in verbal tests. In this respect Dave's findings were similar to those of Vernon.

Heim, in collaboration with other workers (1949, 1950a, 1950b) undertook an elaborate programme that provided an interesting comparison of the effects of repeated administrations of the same test on normal adults and 'high grade mental defectives'. Results indicated that the mean score of the mentally defective subjects showed a gradual increase throughout the ten testings carried out in the programme. The 'intelligent subjects', on the other hand, registered only marginal increases in average score on

re-testing. Heim and his collaborators were, however, convinced that in all cases practice tended to improve the test-scores. But the less intelligent subjects were noted to have improved their scores to a larger extent, particularly on 'visually biased' items.

Peel published (1951 & 1952) the results of two investigations that he had conducted to examine the effect of practice on intelligence test scores. His first paper was 'confined to the practice effect between two tests'. Boys and girls belonging to the age-group 10-11 years and between 1200 and 1600 in number, were tested on two occasions (four to five weeks apart) by different Moray House Tests. There was no coaching between the two tests and the I.Q.'s on the second occasion were computed by adding the 'extra months of chronological age'. Peel's general conclusion from this study was that 'a mean practice effect of anything up to 5 points of I.Q.' might be expected when two verbal intelligence tests are administered a few weeks apart. Peel's second study (1952) was aimed at investigating the 'effect shown between three testings' on a large sample, including 1239 boys and girls of the age-group 10-11 years. Three Maray House intelligence tests were administered at 'roughly monthly intervals'. The mean scores computed from each testing showed that when three tests were administered consecutively, at fairly short intervals, the main practice effect occurred at the second testing, and the improvement in score noted between the second and the third testing was quite small. For both boys and girls the average gain in I.Q. after the second testing was 3.85, but the gain between the second and the third testing was only .90. Peel also noted that the appreciable gain observed after the second testing tended to disappear entirely when the period before retesting was extended to six months. An examination of the 'differential practice effect at different levels of I.Q.' indicated that in general, there was a direct relation between the magnitude of gain and the initial ability level of the subjects. The small average gain noted after the third testing was, similarly, 'attributable to improvement in the upper ability levels of the age group'. These results are evidently at variance with those reported by Terman & Merrill (1937).

Vernon (1952a & 1952b) summarized the results of different studies on practice and coaching in two articles published in *The Times Educational Supplement* and observed that

- (a) The gains resulting from practice ranged from 2 to 9 points of I.Q. with an average gain of 4 to 5 I.Q. points.
- (b) bright children would 'benefit more than dull' children.
- (c) adults of normal intelligence showed almost the same gains as

EFFECTS OF COACHING ON INTELLIGENCE TESTS

'pupils of 10 years up'.

- (d) the effects of practice changed with the type of items. Improvement on non-verbal items seemed to be more than on verbal items. Similarly, improvement on items on direction, analogy and number series was more than the improvement on synonyms, antonyms, vocabulary and information.
- (e) no difference in practice effect seemed to exist between the omnibus and the classified form of a test.
- (f) the larger the number of items or sub-tests in a test, the higher would be the gain.
- (g) gains resulting from practice lasted for a few months and appeared 'to be roughly halved' after a year.

About coaching Vernon drew the following conclusions:

- (a) The average rise was nearly 14 points, 'ranging upto 18 points in brighter and entirely unsophisticated pupils but down to 9 points in duller and more experienced classes'.
- (b) The total amount of coaching did not make any appreciable difference in the size of the gain.
- (c) There was hardly any difference in the coaching ability of different teachers.
- (d) The test that registered a large gain from practice also showed a large gain from coaching.
- (e) The effects of coaching appeared to 'fade more rapidly than those of practice'.
- (f) The major effects of coaching were highly specific. They were found to 'apply to exactly parallel tests' but did not 'transfer to other, even moderately similar tests'.

Vernon suggested that 'all schools should... apply a practice test' and should coach students on it for three to four hours in order to make all the children equally familiar with 'the kind of test they were to take' in the critical selection examination.

THE SYMPOSIUM ON COACHING AND PRACTICE EFFECT

The British Psychological Society at its annual meeting in 1953 held a symposium on the subject. Papers contributed to this symposium

considered different aspects of the problem. For Yates (1953) two points were of paramount importance. One was the size of the gain resulting from coaching and the other was the question of official sanction of coaching in all schools.

Regarding the 'size of coaching gains' Yates reported the results of three 'pilot investigations'. In the first, he administered on a group of children 'ten complete Moray House examinations' at weekly intervals. Each examination consisted of an intelligence test, an arithmetic test and an English test. In the intervals between the examinations the students were coached by their teachers. The results showed that students receiving a combined treatment of practice and coaching registered a mean gain of 8 points. For the control group the corresponding gain was only 3 points. In the second pilot study the Otis Advanced Examination was used. This study revealed a mean gain of 9 points for the experimental group and of over 5 points for the control group. The third experiment was conducted on a sample consisting of secondary school children who received three, six and nine hours of coaching. The average gain attained by the three experimental groups was 8.5 points and that by the control groups 6 points.

The main experiment was carried out on a large sample ($N = \text{above } 1200$) drawn from 20 junior schools. 'Some of these children received coaching, others were given the opportunity of working six practice tests... Moray House tests were used throughout the experiment as the first and final tests, as practice tests and also as coaching material.' There were control groups of comparable age and range of ability. Results showed that 'the coached children made a mean gain of between five and six points, the children who enjoyed unassisted practice obtained a mean gain of six points, and the control group's score improved by about three points.'

The smaller gains noted by Yates did not agree with Vernon's findings which showed an average gain of 15 to 18 points. Yates attributed this difference to sample characteristics and also to the tests used in his investigation. A follow-up study conducted on 'children whose gains or losses varied considerably' from the group-average suggested that factors like changes in the mood, motivation and emotional state of the subjects were responsible for the larger gains and losses.

From the results of his experiments, Yates concluded that 'officially sanctioned coaching' was both 'unnecessary and undesirable'. It was unnecessary because 'working of a few practice tests' could 'offset the effects of any coaching' since the greater part of the gains produced by practice was found to 'occur between the first and second tests'. Yates also felt that 'encouragement of coaching by local education authorities' would

affect the 'life and curriculum' of the schools in an adverse way and would 'reintroduce just those evils' which the school authorities 'intended to mitigate' by introducing intelligence tests into the selection programme.

James (1953) disapproved of the recommendation of the National Foundation that 'unassisted practice without coaching' should precede the examination for allocation purposes. According to him, the recommendation, if implemented, would encourage 'black-market coaching by parents and teachers in out-of-school hours'. As a precaution against this possible malpractice James recommended 'coaching for all'. Results of intelligence test performance which he collected from Wiltshire showed that the introduction of official 'coaching for all' brought about an 'overall average rise of 4.3 points for boys and 5.5 points for girls', although two-thirds of the subjects were already receiving some kind of unofficial coaching. The increase in score among the uncoached children, James argued, was surely more than the figures quoted above. So an uncoached subject was likely to 'suffer a considerable handicap' particularly in those areas where the I.Q. was doubled to draw up a merit list. Consequently, James concluded that 'coaching for all' was the only way to 'iron out' the 'inequality' and remove the 'injustice'.

Dempster (1954) reported the results of a series of investigations undertaken in 1951. Children of 11+ collected from eight schools were divided into 'three balanced sections' on the basis of the scores of Moray House Intelligence Tests. Group-A was the control group; Group-B had practice in Moray House Intelligence Tests and Group-C received coaching. There were 112 girls and 116 boys in each group. The practice group (B) was given a new Moray House Intelligence Test each week and this programme ran for eight weeks. The coaching group (C) received one period of coaching each week after the second test and 'worked a new Moray House Test after each period of coaching'. Performance records for boys and girls were separately maintained but patterns of the result did not show any difference for the two sex groups. The control group showed a mean increase of 1.7 points for boys and 2.4 points for girls. The gains for boys and girls of the practice group were 4.5 and 5.5 points respectively and the corresponding figures for the coaching group were 8.9 and 9.8.

The investigation also revealed that

- (a) both practice and coaching increased the mean score but coaching produced a greater increase than practice.
- (b) the gains resulting from both practice and coaching tended to become steady or to drop off after a short period.
- (c) effect of both practice and coaching was similar for boys and girls.

In view of these findings coaching was introduced into the 'classification procedure' for 1952. This new programme did not include 'practice' since it produced only a small gain in the 1951 study. Subjects initially took a Moray House Intelligence Test. Then followed a four weeks' programme of coaching by class teachers who devised their 'own methods of coaching'. At the end of the programme a second test was applied. The results, according to Dempster, were not encouraging. In place of an expected rise of some nine points (in view of the 1951 results), the observed gains were 4.1 for boys and 5.8 for girls.

In the light of the experience of the 1952 study, a modification was introduced in the 1953 programme. In this case, the first administration of a Moray House Test was followed by two weeks' coaching. Then a second test was applied. This was followed by another two-week coaching programme and then the final test was administered. The increase in mean scores from the first to the second test was 4.6 points for boys and 4.7 points for girls. 'From the second to the third test there was a further increase of 2.9 points for boys and 4 points for girls, giving a total of 7.7 points for boys and 8.7 points for girls'. Dempster's conclusion was that 'results approximating to those obtained experimentally in 1951' could be produced by a 'comparatively simple coaching programme'. So coaching was a 'practical proposition' and it was to be continued to ensure fairness to all children. The Southampton investigations also suggested that coaching on dissimilar materials was less effective than coaching on similar materials.

Wiseman's study, known as the 'Manchester Experiment', was aimed at comparing the effects of coaching and practice. The sample collected from 13 primary schools, comprised 381 children of an average age of 9.9 years. None of the children had any previous experience of intelligence tests. The coaching and the control groups took only the first and the last tests. Coaching, in Wiseman's study, included blackboard work and questions and answers 'based on commercially available books of "intelligence" tests' (because this type of material was known to be used most frequently in out-of-school coaching). The time spent on coaching and practice was the same. The results showed a rise of 4.7 points on mean I.Q. for the control group. The practice group registered an average gain of 11.1 points. For the coaching group, the corresponding gain was 6.4 points. 'The practice effect was found to be largely produced by the first three or four tests'. Wiseman also found a direct relation between the initial I.Q. and the gain attained by the children. Thus it was noted that at I.Q. 80, the gain was 4 points; at I.Q. 100, 11 points, and at I.Q. 120, 18 points. No such trend could be discerned in the case of coaching.

Commenting on the results of this experiment, Wiseman wrote : 'The symposium shows very clearly that the results from a considerable number of investigations reveal (a) a high degree of accord in the gains found from simple practice and (b) most discrepant results from the use of coaching.'

The divergent results observed on the effectiveness of coaching were to be explained, according to Wiseman, by the lack of uniformity in the 'definition of the term coaching.' Wiseman also observed that the Manchester experiment had established that Vernon's concept of 'test-sophistication' did not simply mean familiarity with 'certain types of items' or an acquaintance with the techniques of answering particular types of questions. The concept meant a 'total test-experience', attainable only by actually taking a test.

Vernon's paper (1954) tried to sum up the findings of the different contributors by enumerating the points of agreement and disagreement among the results of the different studies. The following points of agreement were mentioned by Vernon :

1. Previous practice and/or coaching had a definite influence on intelligence test scores.
2. The effects of any type of practice of coaching were limited. Practice and/or coaching beyond a certain amount could not increase the test-scores of the subjects.
3. Individual differences did exist in the gains in score attained by practice and/or coaching. The typical range was from +20 to -8 units, with an S.D. of about 5.5.
4. The effect of practice and/or coaching was different on different types of items.
5. The more diverse the types of items, or sub-tests within a test, the greater was the test's improvability.

The points of disagreement noted by Vernon were as follows :

(1) The gains attainable by coaching were found to be different in different studies. While most of the earlier studies reported a gain of about 15 I.Q. units and more, the experiments by James, Dempster & Wiseman indicated a gain of 5 to 6 units only. Vernon attributed this discrepancy primarily to 'previous sophistication' or 'aptness' of coaching and only partly to the 'problems of units' and difficulty levels of tests. He did not accept Wiseman's observations regarding coaching and asserted that test-sophistication and aptness of coaching could account for the larger part of the gain.

(2) The second point of disagreement was about differences between

teachers as coaches. According to Vernon, 'most small-scale experiments in which the psychologists themselves, or specially selected and trained teachers, do the coaching seem to yield larger rises than bigger investigations where more miscellaneous teachers or all the teachers in an education area, undertake coaching'. Vernon seemed to favour the idea that 'class variations are likely to be larger still when some teachers coach or practice and others don't'. As such, he rejected the contention that authorized coaching would increase the difference in coaching gains between classes.

(3) The relation between initial ability and susceptibility to improvement by coaching or practice was found to be different. But the common-sense view that dull children would benefit less than bright students from 'uninstructed practice' but would gain more from coaching appeared to be a valid assumption.

(4) As to the relation between age and coaching gain, adequate data seemed to be wanting but available reports indicated that the same relation held good among adult students and pupils belonging to the 10-12 years age-group.

(5) Sex differences in gains resulting from coaching/practice formed another point of dispute. Some investigators believed that boys gained more by coaching. But some other held that the gain was larger for girls. The points, therefore, required clarification.

In his recommendations to counter the effects of coaching/practice, Vernon stated that 'the use of relatively non-improvable tests or changing the types of test item... might appreciably reduce the... unfairness but would do nothing to lessen the pressure on children'. Consequently, he concluded that in areas where coaching was known to be widespread and competition severe, it was 'essential to give two parallel trials of the whole selection examination... before the final one'. But in areas where 'grammar school provision' was easier and coaching less common, 'a single trial run plus coaching' would be adequate to 'iron out most of the differences between classes or individuals' with varying amounts of previous test experience.

OTHER RELATED STUDIES

Apart from the question of the effect of coaching or practice on intelligence or scholastic aptitude test-scores, several investigators have directed their attention to certain other aspects of the problem.

Wiseman and Wringley (1953) reported the results of an investigation conducted on the same lines as described earlier. The findings of this work

led the authors to conclude that practice produced larger gains than coaching and that such gains were dependent on the initial level of the subject's intelligence.

McIntyre (1954) undertook a study to find 'if changes in instruction reduced the effects of practice and coaching'. For this purpose he worked with four groups 'comparable as nearly as possible in age, intelligence and test-sophistication'. All groups took Jenkin's Non-verbal Scale of Mental Ability II. The first group (control group) was given the test according to the original printed instructions. For the second group, the original instructions were simplified in order to facilitate comprehension. The third group received explanatory instructions and also a 'brief explanation of the method of finding the correct answer to each type of problem'. The fourth group was given coaching for four weeks on a parallel form of the test before the Non-Verbal Scale II was re-administered to all the groups. The results indicated that

1. coaching improved the scores on Jenkin's Non-verbal Scale II to a large extent.
2. practice also produced a 'significant but smaller' improvement.
3. simplifying the instruction and adding an explanation of how to respond to each type of item, did not 'counteract entirely' either coaching or practice effect but reduced 'both to a small extent'.

In an instructive paper Burt (1954) discussed the results of different studies on coaching. He felt that the term 'coaching' as used by different investigators was 'highly ambiguous'. To some teachers the term signified merely an 'attempt to familiarise prospective candidates with the general process of being examined as distinct from being taught'. There was no provision for actual practice on the 'expected types of question'. This type of coaching made the child prepared for the test-situation which would be otherwise a 'strange and formidable ordeal'. The second meaning implied that coaching should aim at 'giving practice'. The most pronounced effect of this type of test was to be found in the speed with which the general nature of each type was grasped. Thirdly, coaching also meant making the child's memory 'well-stocked' with the correct kind of answers. This type of coaching was supposed to enable the child to have many answers 'ready at the tip of his tongue'.

Burt offered three suggestions for eliminating the effects of differential practice and experience. 'Firstly, teachers should be encouraged to accustom children to similar trials by introducing, once or twice every year, formal examinations similar to those the students would face at 11 plus,

Secondly, allocation tests should avoid complicated instructions which might be 'familiar to some and unfamiliar to others'. Burt's third suggestion was against the uncritical acceptance of tests constructed by inexperienced persons. Tests should be constructed by a 'competent investigator' and their contents should be constantly varied.

These steps, according to Burt, would only partly remove the influence of differential practice and experience. To meet the problem adequately, one should have a 'more exact estimate' of the effects resulting from practice and/or coaching. In order to make himself acquainted with these effects Burt considered the results of the investigation undertaken by Watts at the instance of the National Foundation for Educational Research. Burt enumerated three effects. The first was related to the degree of improvement owing to practice and coaching. Since all the children in the control group showed an increase of 2 or 3 points, the observed gain of 6 or 7 points by the groups receiving practice or coaching actually reduced to 4 or 5 points. Regarding the relative efficiency of practice and coaching, it was difficult to arrive at a firm conclusion. Under the second point, Burt considered three factors that led to increase in scores. The first was the efficiency of the coach. Burt believed that the 'efficiency of coaching varied enormously according to the teacher' undertaking the task. The second factor that determined the size of the gain was the nature of the tests. In Burt's analysis, items on analogy, number, and letter and word series were easily influenced by familiarity and practice. The items which were least affected included those on synonyms, antonyms, vocabulary, information and the majority of the verbal tests. The third factor was the 'abilities of the pupils'. Burt asserted that the performances of the dull children were hardly improved by coaching but there was little doubt that brighter children profited more 'readily by experience and training, particularly in certain types of group tests'.

Regarding the 'effect on allocation'—a vital issue, Burt held that the 'injustice likely to be done' by the differential effects of coaching and practice was 'comparatively small'. For children well above the borderline or well below it, there would be no change in allocation. Only the borderline cases were likely to be affected. But whether a 'doubtful candidate' would or would not cross the borderline was 'largely a matter of chance'.

The 'conflicting results' of the earlier studies and 'Vernon's analysis of their causes' led Heim and Watts (1957) to undertake a study in which the investigators used the terms coaching, practice and discussion of errors with well-demarcated operational meanings. The term coaching signified 'working through with the subjects' problems' which were very similar but not 'identical' with the problems that formed the test. Thus coaching here

included some amount of practice, although there were separate provisions for 'straightforward practice'. Discussion of errors 'consisted in going over with the children about a dozen questions' which the majority of the students had answered wrongly.

According to the investigators, the results of the experiment were 'confused' by two factors. The first was that 'difference between schools were as great as or greater than the differences between sub-groups'. The second was that increases in score were very 'spasmodic'. The following 'tentative conclusions' were, however, reached:

1. Discussion of errors produced the maximum gain.
2. Coaching with practice was more effective than practice alone on different tests.
3. Practice alone on different tests yielded better results than practice alone on the 'same' test.
4. Practice, either on identical or on similar tests, did not produce any difference in result when it was offered with coaching.

Personality differences among individuals and groups were found to have a significant influence on the results. Some students were 'exceptionally keen' and lively, while some others were uninterested and exhibited a kind of passive resistance. So an 'idle bored collection of children' was not likely to benefit much from discussion of errors or from coaching.

Curr and Gourlay (1960) tried to ascertain the practice effect on tests in mechanical reading, reading comprehension and arithmetic, administered at varying intervals of time. The investigation was also expected to provide a measure of practice effect not only at the average level, but also at the level of pupils to be found in remedial groups.

Children between nine and ten years of age were selected from four primary schools. The tests used were:

- (a) Reading Comprehension Test (Forms A and B) by Schonell
- (b) Graded Word Reading Test
- (c) Mechanical Arithmetic Test (Form A)

The statistical analysis provided estimates of the mean gains for two age-groups—9.5 years and 7.5 years respectively.

Practice effect was found to be the 'greatest for reading comprehension'. At the age level 9.5 years a re-test after one month produced a mean gain of 10.1 months and further re-tests after 3 and 6 months gains of 18.2 and 26.9 months respectively. The corresponding figures at the age level 7.5

years were 8.9, 10.4 and 12.2 months.

For the mechanical reading test, the gains were 5.3, 8.0 and 14.1 months at the 9.5 level and 4.4, 6.2 and 11.8 at the 7.5 level. Practice effect was only marginal for the arithmetic test.

Students taking both forms of reading comprehension tests at an interval of one month showed gains of 7.2 and 4.2 months at the 9.5 and 7.5 levels respectively.

An examination of the magnitude of the gains showed that they could not be attributed to maturation alone—because a normal rate of maturation (i.e. one month of development per month of time) could not explain the gains, particularly those registered in reading comprehension tests. No definite pattern was discovered regarding the relation between the initial ability level and gain through practice.

The investigators tried to determine the exact effect of coaching in order to verify their assumption that the gains registered by remedial education could possibly be explained by coaching. For this purpose two criteria were used. According to the first criterion, coaching would improve test-skills rather than bring about a genuine improvement in the basic skill. The second criterion was related to the transitory character of coaching gains. By using different types of material to measure the same basic skill and by testing how long the children were able to retain the gains, the authors came to the conclusion that 'remedial education, at least as practised at the moment', had no lasting impact. The gains produced by remedial teaching were largely a product of practice and coaching.

Macnamara (1964) published the findings of an investigation which tried to measure the practice effect of Moray House English Quotients. 96 children (48 boys and 48 girls) selected from two Dublin schools formed the sample. Unlike the English children, these subjects were 'totally unfamiliar with "objective" tests of any sort'. But the effect of practice showed a close agreement in findings of 'similar studies in Britain carried out with verbal reasoning tests'. A single practice test produced the largest gain of (i.e. an average gain 3-4 points) and the cumulative effect of several practices showed a gain of 5 to 6 points.

Netley and others (1965) reported the result of a work that tried to 'determine the extent of practice effects occurring between tests in the absence of specific coaching'. The test used was the Neale Analysis of Reading Ability. The sample included 68 children of a primary school. The sample was divided into four groups whose mean age varied from 9.10 years to 9.85 years. The test was re-administered at two intervals: (a) one week and (b) fourteen-fifteen weeks. It was assumed that the practice effect would be maximum at the interval of one week while the influence of

EFFECTS OF COACHING ON INTELLIGENCE TESTS

maturational factors would be pronounced during the second interval. For retesting, both parallel and the same forms of the test were used. The data were subjected to analyses of variance and co-variance. The results did not reveal any significant increase when the test was applied after one week. The scores 'did show some increase after a period of three months, but did not reach statistical significance'. The authors felt that a period of three months was too short to bring about an improvement in reading ability. Still they did not rule out the possibility of a general conclusion that 'all reading tests were not subject to retest distortion'.

Droege (1966) reported the results of a study to 'determine the effects of a previous administration of the General Aptitude Test Battery upon scores based on a subsequent administration of an alternate form of the GATB when the interval between initial testing and re-testing' was one, two and three years respectively.

The sample comprised 896 adult subjects, all of whom belonged to the age-range 25-34 years. The reason for selecting this age-group was that it represented the interval during which the effects of maturation and aging upon GATB scores seemed to be minimal. None of the persons tested had any familiarity with the test. The total sample was divided at random into three sub-samples to be re-tested with an alternative form after one year, two years and three years. The results indicated significant increases in mean scores for all sub-tests even when the interval between the two testings was three years. For verbal aptitude, clerical aptitude, motor co-ordination, finger dexterity and manual dexterity, gain in score was found to be a result of the interval. The size of increase in scores on numerical and spatial abilities was found to be related to the initial level of ability. For numerical aptitude this relation was negative, but for spatial aptitude it was positive. For other aptitudes, there was no evidence of either a positive or a negative relation.

CONCLUSIONS

The present survey would indicate that in spite of a broad agreement regarding the general effect of practice and coaching, there are several areas where no generalization is possible. Even after fifty years of research it is not possible to make conclusive statements on certain aspects of coaching and practice. It is to be noted that most of the investigators have tried to understand the size of the gain produced by coaching and practice. This is presumably because almost all of them were concerned with making some kind of recommendation to the educational authorities regarding coaching. But here, too, no consensus seems to have been reached. James,

Dempster and Vernon recommended coaching for all. Yates, on the other hand, is known to have expressed himself strongly against 'officially sanctioned coaching' which, to him, is both 'unnecessary and undesirable'. Wiseman did not make his stand sufficiently clear on this issue. Even the meaning of the term 'coaching' is not, as Burt (1954) pointed out, the same for different investigators. To some investigators coaching means working out examples on the blackboard. To some others, it means explaining the instructions, showing the errors and indicating how to work rapidly with different types of items. It is not at all surprising that students, when coached in such divergent ways, would show different amounts of gain in score. Similarly, the term 'practice' has been used to mean practice on the same, similar or different tests, with or without knowledge of results of the previous performance.

The review also shows that clarification is required on the following aspects of the problem:

- (1) The relative effectiveness of coaching and practice. Among the symposiasts James and Dempster found that coaching was more effective than practice. Yates and Wiseman reached the opposite conclusion.
- (2) The relation between the initial level of intelligence (or aptitude) and the size of the gain. Vernon is inclined to believe that brighter children benefit more from coaching and practice. But the findings reported by Terman and Merrill, McIntosh, Heim, and Droege do not confirm this view.
- (3) The relation between age and size of the gain. In spite of passing references by Terman & Merrill, Rodger, and Droege, the relation does not seem to be sufficiently clear.

The emphasis on the divergent nature of the findings is not, however, intended to mean that all investigations made in this area during the last fifty years have been fruitless. The purpose here is only to find out the areas in which further exploration is possible and perhaps necessary.

There are, no doubt, several areas which have shown more or less uniform results. These include the relation between coaching gains and type of materials or items used, differential effects of coaching/practice on boys and girls, instability of the gain attained through coaching/practice, etc. As undisputed areas, they do not present any problem to a research worker. If a researcher wants to study a problem related to coaching and practice effects on aptitude tests, he must turn his attention to the unsolved or disputed aspects of the problem. Moreover, as stated in the introduction to this paper, controversies existing in the areas mentioned must be

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resolved in order to fill in the gaps in our existing knowledge regarding the effects of coaching and practice on intelligence and scholastic test-performance.

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A Comparative Study of Questions in Chemistry Textbooks

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Introduction

Textbooks play an important role in any system of education. Much effort has been made for the improvement of textbooks with respect to their readability and pictorial and graphic presentation. However, one of the important aspects of a textbook—the exercises given at the end of each chapter—is often neglected.

Need of the Study

“Quality of the textbook is one of the major variables that condition and control the quality of education” (Dave, 1971). Hence the need to improve school textbooks.

In the absence of higher level questions in textbook exercises, a serious lacuna remains. The investigator felt that an analysis of the types of

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questions given in the textbook exercises, in order to ascertain their quality, would be an important step in locating the weaknesses in this area and for suggesting steps to improve the quality of textbook exercises.

Statement of the Problem

The present study was entitled as:

'A comparative study of questions in two chemistry textbooks prescribed by the Rajasthan Board of Secondary Education and the Central Board of Secondary Education.'

Purpose of the Study

Stated specifically the objectives of the study were:

- (a) To investigate the types of questions classified in terms of Bloom-Sander's Taxonomy, contained in a secondary class chemistry textbook prescribed by the Rajasthan Board of Secondary Education.
- (b) To investigate the types of questions classified in terms of Bloom-Sander's taxonomy, contained in a secondary class chemistry textbook prescribed by the Central Board of Secondary Education.
- (c) To make a comparison of the types of questions, contained in textbooks analysed in (a) and (b) given above.

Hypothesis

There will be no significant difference between the exercise questions of the Rajasthan Board chemistry textbook and those of the Central Board chemistry textbook.

Selection of the Textbook for Analysis

The following two chemistry textbooks prescribed by the Rajasthan Board and the Central Board of Secondary Education were selected for analysis: (a) *Modern Chemistry*, (b) *A New Textbook of Inorganic Chemistry*.

Methodology

Bloom-Sander's taxonomy was used as an analytical tool in this

A COMPARATIVE STUDY OF QUESTIONS IN CHEMISTRY TEXTBOOKS

investigation, because this tool can enable us to ascertain the kind of mental process, we are encouraging or perhaps neglecting through the exercises in the textbooks.

In order to achieve an adequate degree of validity of classification on the basis of Bloom-Sander's taxonomy, the investigator discussed with experts the nature of each of the categories. For illustration, a few examples of the questions classified in all the seven categories of Bloom-Sander's taxonomy are listed below.

- Memory :* What are physical properties ? How is a physical property different from a chemical one ?
- Translation :* Write a brief essay in your own words: 'Chemistry in the service of mankind'.
- Interpretation :* Write a reaction of neutralization in the form of a question.
- Application :* Try to justify:
(a) Chemistry is a living science.
(b) Chemistry is the most useful branch of science.
- Analysis :* How would you purify a liquid if it contains another liquid as an impurity and the two liquids are miscible ?
- Synthesis :* Give two examples, one of a pure compound, the other of a solution: propose experimental hypotheses to distinguish between them.
- Evaluation :* Which one method is more applicable for the separation of volatile liquids and why ?

On this basis the investigator first studied the content matter of both the textbooks and then, keeping in view the concepts of Bloom-Sander's taxonomy, each question was carefully examined in terms of its potentiality to foster the cognitive process.

Findings

As indicated in the table the findings of this study are as under:

None of the 248 questions, analysed from the Rajasthan Board textbook, required from the students a mental operation at the translation level. As many as 186 (75%) questions measured cognitive operation at memory level, four (1.613%) at interpretation level, 16 (6.452%) at application level, 33 (13.307%) at analysis level, four (1.613%) at synthesis level and five (2.015%) at evaluation level.

In the Central Board textbook, out of 249 questions, 139 (55.83%) questions measured cognitive operation at memory level, five (2%) at translation level, 11 (4.41%) at interpretation level, 43 (17.26%) at applica-

Item analyses

COMPARATIVE STUDY OF TWO CHEMISTRY TEXTBOOKS' QUESTIONS

*Classification of R.B. Textbook
questions into Bloom-Sander's
taxonomy cognitive process
N=248*

*Classification of C.B. textbook
questions into Bloom-Sander's
taxonomy cognitive process
N=249*

<i>Cognitive process</i>	<i>Number of questions</i>	<i>Percentage %</i>	<i>Number of questions</i>	<i>Percentage %</i>
Memory	186	75	139	55.83
Translation	—	—	5	2.00
Interpretation	4	1.613	11	4.41
Application	16	6.452	43	17.26
Analysis	33	13.307	26	10.44
Synthesis	4	1.613	8	3.24
Evaluation	5	2.015	17	6.82
Total	248	100.00	249	100.00

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tion level, 26 (10.44%) at analysis level, eight (3.24%) at synthesis level and 17 (6.82%) at evaluation level.

ANALYSES—THE NULL HYPOTHESIS WAS TESTED BY APPLYING CHI-SQUARE TEST

Cognitive Process	R.B. Textbook questions %		C.B. Textbook questions %		
	Observed Frequency	Expected Frequency	Observed Frequency	Expected Frequency	
Memory	75.00	65.415	55.83	65.415	130.83
Translation	00.00	1.00	02.00	1.00	2.00
Interpretation	01.613	3.011	04.41	3.011	6.02
Application	06.452	11.856	17.26	11.856	23.71
Analysis	13.307	11.87	10.44	11.87	23.75
Synthesis	01.613	2.426	03.24	2.426	4.85
Evaluation	02.015	4.417	06.82	4.417	8.84

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

The Value of $\chi^2 = 14.627$

Degree of freedom = $(r-1)(K-1)$

df = $(7-1)(2-1) = 6$

P at .05 level is greater than 12.59.

Where O_{ij} = Observed number of cases categorized in its row of jth column.

E_{ij} = Number of cases expected under H_0 to be categorized in ith row of jth column.

$\sum_{i=1}^r \sum_{j=1}^k$ directs one to sum over all (r) rows and all (K) columns, i.e. to Sum over all cells.

Conclusions

Thus the results obtained in this study revealed that the number of questions, which required cognitive operation at higher level, was larger in the Central Board textbook than the Rajasthan Board textbook, which is confirmed by testing the null hypothesis with the help of the Chi-Square test. The value of χ^2 (14.627) is significant at .05 level. Hence it rejects the null hypothesis. Thus it is revealed that the Central Board textbook exercise questions were better than the Rajasthan Board textbook exercise questions.

Suggestions for Improving Textbook Questions

In the opinion of the investigator the following suggestions should be considered for the improvement of textbook exercise questions.

1. The findings of the study suggest that in exercises given by the teachers more higher level questions should be included than is the practice at present.
2. Teachers and textbook writers should be trained in designing and asking questions to successfully develop the higher thinking abilities among students through textbooks and classroom exercises. Hence, it appears desirable to lay greater emphasis on this aspect in the training of teachers and authors.
3. A lot of advance planning about exercises should be done whenever a textbook is proposed to be brought out, because exercises planned and written in a hurry are likely to lay undue emphasis on memory and reproduction of textual material.

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A Study of the Quality of Question-Items Set in the General Science Examination Paper

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INTRODUCTION

The multiple choice, very short answer and short answer type questions were introduced in the examinations of the Board of Secondary Education, Rajasthan, in 1965. An attempt is made here to evaluate the quality of the question-items of different types (multiple choice, very short and short answer) set for the general science examination paper (reproduced in the Appendix) of the year 1972.

Sample of the Study

The study is based upon a critical re-examination of 224 answer books (42, I class, 62, II Class, 75, III Class and 45 failed) of the examinees selected on the basis of the stratified sampling technique.

Procedure of the Study

Item analysis techniques (A. Lang (1967); Cox (1965); Frederick

(1952)) are used here to study the quality of the items. The response patterns are investigated for computing the indices of 'Difficulty' and 'Discrimination'. The formulae used for the computation of the Difficulty Index and the Discriminating Index as given in L.E. Robes (1972) are quoted below:

1. *For multiple choice type questions :*

$$\text{Difficulty Index} = \frac{R_H + R_L}{N_H + N_L}$$

$$\text{Discriminating Index} = \frac{R_H}{N_H} - \frac{R_L}{N_L}$$

2. *For very short answer and short answer type questions :*

$$\text{Difficulty Index} = \frac{R_H + R_L}{X_M (N_H + N_L)}$$

$$\text{Discriminating Index} = \frac{1}{X_M} \left\{ \frac{R_H}{N_H} - \frac{R_L}{N_L} \right\}$$

Where R_H = the number of students who answered the questions correctly in the higher group.*

R_L = the number of students who answered the questions correctly in the lower group.*

N_H = the total number of students in the higher group.

N_L = the total number of students in the lower group.

X_M = the maximum number of value points an individual could receive on the question. In the present case we have allotted one value point to each of the processes involved in answering the questions.

RESULTS AND DISCUSSION

Multiple and Very Short Answer Type Items

In Section A of the question paper (Appendix) there are 20 multiple choice type (MCT) questions and five very short answer type (VSAT) questions. The results of the item analysis of these 25 questions are summarized in Table 1.

*For our study we have taken under higher group all the 42 students who secured Class I marks in the paper and in the lower group all the 45 students who failed in the paper.

QUALITY OF QUESTION-ITEMS

TABLE 1

<i>Question No. and type of questions according to the question paper (Appendix)</i>	<i>Cognitive objective to be tested by the question</i>	<i>Difficulty Index</i>	<i>Discrimination Index</i>	<i>Inference</i>
1 (MCT)	Knowledge	0.8	0.3	Easy, poor in discriminating
3 (MCT)	„	0.92	0.026	Very easy, very poor in discriminating
4 (MCT)	„	0.63	0.34	Reasonably good item
6 (MCT)	„	0.55	0.22	Moderate, poor in discriminating
7 (MCT)	„	0.52	0.022	Moderate, very poor in discriminating
10 (MCT)	„	0.78	0.24	Easy, poor in discriminating
11 (MCT)	„	0.67	0.2	Easy, poor in discriminating
12 (MCT)	„	0.36	0.29	Easy, poor in discriminating
10 (MCT)	„	0.73	0.29	Very easy, poor in discriminating
15 (MCT)	„	0.54	0.55	Moderate, good in discriminating, good item
18 (MCT)	„	0.33	0.32	Very difficult, reasonably fair in discriminating
19 (MCT)	„	0.58	0.33	Easy, reasonably fair in discriminating
21 (VSAT)	„	0.62	0.7	Easy, good in discriminating
24 (VSAT)	„	0.5	0.46	Reasonably good item
2 (MCT)	Understanding	0.45	0.57	Difficult, good in discriminating
5 (MCT)	„	0.53	0.28	Moderate, poor in discriminating
8 (MCT)	„	0.40	0.058	Very difficult, very poor in discriminating
9 (MCT)	„	0.52	0.49	Moderate, good in discriminating
13 (MCT)	„	0.55	0.6	Reasonably good question
16 (MCT)	„	0.69	0.52	Easy, good in discriminating
17 (MCT)	„	0.75	0.4	Easy, reasonably good in discriminating
20 (MCT)	„	0.26	0.25	Very good question
23 (VSAT)	„	0.75	0.44	Very easy, good in discriminating
25 (VSAT)	„	0.36	0.46	Poor question
22 (VSAT)	Application	0.3	0.5	Very difficult, good in discriminating

We find from Table 1 that a large number of multiple choice type questions testing knowledge fail to distinguish between the better and the poorer examinees. It is observed that half of the multiple choice type

questions testing understanding and application objectives are satisfactory. We may also note that the very short answer type questions are fairly good.

Short Answer Type Questions

In Section B of the paper (Appendix) there are ten short answer type questions. Calculated indices of difficulty and discrimination for these questions are summarized in Table 2.

TABLE 2

<i>Question No. and type of questions according to question paper</i>	<i>Cognitive objective to be tested by</i>	<i>Difficulty Index</i>	<i>Discriminating Index</i>	<i>Inference</i>
4 (SAT)	Knowledge	0.43	0.31	Difficult, poor in discriminating
6 (SAT)	"	0.66	0.32	Easy, poor in discriminating
8 (SAT)	"	0.28	0.4	Very difficult, reasonably good in discriminating
10 (SAT)	"	0.17	0.3	Too difficult, poor in discriminating
5 (SAT)	Understanding	0.345	0.63	Difficult, good in discriminating
9 (SAT)	"	0.4	0.38	Difficult, reasonably fair in discriminating
7 (SAT)	Application	0.4	0.13	Difficult, very poor in discriminating
11 (SAT)	"	0.28	0.42	Too difficult, good in discriminating
12 (SAT)	Skill	0.51	0.2	Moderate, very poor in discriminating
13 (SAT)	Skill	0.45	0.21	Difficult, very poor in discriminating

From the inspection of the table one can conclude that the majority of the short answer type questions appear to be difficult and fail to distinguish between better and poorer examinees.

CONCLUSIONS

We have seen that a large number of questions are poor in quality. Thus the scores of the examinees may not give us a true picture of their achievement in the subject. The present question paper, although of an improved pattern, fails in its objectives due to the poor quality of the questions set. We may say that the paper-setters were not capable of constructing valid and reliable items.

We suggest that a large number of questions of different types (multiple choice and other types) be prepared by subject experts. They may then be administered and item-analyzed. Suitable questions may be pooled together in a question bank and paper-setters may be requested to use these questions.

APPENDIX

SECONDARY SCHOOL, HIGHER SECONDARY (PART I) AND HIGHER SECONDARY EXAMINATIONS, 1972 COMPULSORY—GENERAL SCIENCE

TIME : TWO AND A HALF HOURS
Maximum Marks : 50
Section 'A'

Time—30 Minutes

Maximum Marks—15

1. The Planet farthest from the sun is—
(A) Pluto (B) Neptune (C) Venus (D) Jupiter. () $\frac{1}{4}$
2. The Special feature of metamorphic rocks is that—
(A) They are the oldest.
(B) They are found in layers.
(C) They are formed from other rocks.
(D) They are formed from lava of volcanoes. () $\frac{1}{4}$
3. In the process of photosynthesis plants take—
(A) Carbon dioxide (B) Nitrogen (C) Oxygen (D) Ammonia. () $\frac{1}{4}$
4. The Planet known as morning star is—
(A) Mars (B) Mercury (C) Jupiter (D) Venus. () $\frac{1}{4}$
5. Stalactites and Stalagmites are formed due to—
(A) Rain water.
(B) Dissolution of calcium carbonate in water.

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- (C) Dissolution of calcium carbonate in carbonic acid.
(D) Dissolution of calcium bicarbonate in carbonic acid.) $\frac{1}{2}$
6. Penicillin is obtained from—
(A) Fungus (B) Algae (C) Bacilli (D) Cocci. () $\frac{1}{2}$
- 7 The main function of vitamin C is to—
(A) Strengthen the bones. (B) Help in reproductive process.
(C) Help in clotting of blood. (D) Keep liver healthy. () $\frac{1}{2}$
8. The method of improving the breed of mangoes is known as—
(A) Budding (B) Grafting (C) Mass Selection (D) None of the above. () $\frac{1}{2}$
9. On studying the embryos of fish, hen, rabbit and man we find that—
(A) Embryos of all these living beings are similar.
(B) All animals have developed from Aves.
(C) All animals have developed from pisces.
(D) Man has originated from fish. .() $\frac{1}{2}$
10. The acid formed in dental cavities due to bacteria is—
(A) Hydrochloric acid. (A) Sulphuric acid.
(C) Nitric acid. (D) Lactic acid.)
11. An example of the disease caused due to bacteria and virus is—
(A) Colour-blindness (B) Anaemia (C) Typhoid (D) Beri-beri. () $\frac{1}{2}$
12. Zinc is used in the preparation of—
(A) Electric cells (B) Cycle (C) Railway trains (D) Tools. () $\frac{1}{2}$
13. For cleaning the wounds of skin we should use—
(A) Bleaching powder (B) Detol (C) Kerosene oil (D) D D.T. () $\frac{1}{2}$
14. The main symptom of diphtheria is—
(A) Inflammation in throat (B) High fever
(C) Loose motions (D) Shivering of body. () $\frac{1}{2}$
15. On fractional distillation of petroleum, petrol is obtained from—
(A) 50°C to 70°C (B) 70°C to 90°C
(C) 90°C to 150°C (D) 150°C to 300°C. () $\frac{1}{2}$

QUALITY OF QUESTION-ITEMS

16. Top soil is most fertile because—
(A) It is at the top (B) It receives maximum rain water
(C) It contains more manure (D) It contains humus. () $\frac{1}{4}$
17. Bad conductor of electricity is—
(A) Copper (B) Silver (C) Zinc (D) Mica. () $\frac{1}{4}$
18. An example of carbonic manure is—
(A) Oil cake manure (B) Ammonium Sulphate
(C) Superphosphate (D) Potash Sulphate. () $\frac{1}{4}$
19. The amount of sleep sufficient for adults is—
(A) 12 hours (B) 10 hours (C) 9 hours (D) 6 hours. () $\frac{1}{4}$
20. Aluminium utensils are made of an alloy of—
(A) Aluminium, Copper and Zinc.
(B) Aluminium, Copper and Magnesium.
(C) Aluminium, Copper and Iron.
(D) Aluminium, Copper and Steel.) $\frac{1}{4}$
21. Which instrument is used for locating earthquakes ? 1
22. Why does the central core of the earth show qualities of a liquid as well as solid ? 1
23. Which process will not occur in plants if they do not get light ? 1
24. Mention any one disease caused due to occupations. 1
25. Why does an atom have an equal number of electrons and protons ? 1

SECONDARY SCHOOL, HIGHER SECONDARY (PART I)
AND HIGHER SECONDARY EXAMINATIONS, 1972
COMPULSORY—GENERAL SCIENCE

TIME : TWO AND A HALF HOURS

Maximum Marks : 50

Section 'B'

Time—2 Hours

Maximum Marks—35

1. Explain with the help of a diagram of Fortin's barometer, how atmospheric pressure is measured with it.

{ Description = 3
Diagram = 2

Or

Explain, with the help of a diagram, the working of a maximum/minimum thermometer.

{ Working = 3
Diagram = 2

2. Explain, with the help of a diagram of transmitter and receiver, how do we talk on a telephone.

{ Working = 3
Diagram = 2

Or

Explain with the help of a diagram Wireless Communication System.

{ Description = 3
Diagram = 2

3. How do we get energy in an atomic reactor? Draw the diagram of chain reaction.

{ Description = 3
Diagram = 2

Or

Explain with the help of a diagram the working of an external combustion engine.

{ Description = 3
Diagram = 2

4. Mention any two phenomena occurring on the Earth due to the sun. 2
5. How are natural caves formed? 2
6. Give any four uses of vegetation for human beings. 2
7. If there is a patient of a contagious disease in a house, how can the other members be protected from the disease? 2
8. How is glass prepared? 2
9. How does soap clean dirt? 2
10. What do you understand by polymers? Give any two of its uses in industry? 1
11. Mention one similarity and one difference between the formation of coal and petroleum. 2
12. Draw a labelled diagram of a comet. 2
13. Draw a diagram of any one Xerophytic plant. 2

January 1977

BOOK REVIEWS

Experiments in Psychology

S. M. Mohsin, Orient Longman Ltd., Calcutta. 1975, Price : Rs. 15.50 (Low Cost University Edition)

This book, meant for undergraduate and post-graduate students, is essentially a laboratory manual for experiments in psychology. According to the author, the "need... to make the training in experimental psychology more meaningful... acted as the main stimulus for writing" the book. This need, Dr. Mohsin feels, can be met if the student is made aware of the "rationale" of "every step that he takes" in an experiment. The first three chapters of the book are said to have been directed towards developing this "orientation"—a task which, in Dr. Mohsin's opinion, is often left unfulfilled by most of the existing manuals.

The first three chapters are meant to be the most distinctive feature of the book. Dr. Mohsin is quite candid on this point. These chapters, which deal chiefly with research methodology, seem to be an adaptation of the relevant parts of several well-known books by foreign authors like McGuigan, Woodworth, Scholsberg and Underwood. The first chapter draws heavily on McGuigan's book but it lacks the precision of expression that characterizes the original. The treatment of the concepts of 'exploratory and confirmatory experiments' (a dichotomy used by McGuigan) may be cited as an illustration. In defining an exploratory experiment as one "that is done to discover a relationship", Dr. Mohsin seems to have moved away from McGuigan's very precise description (that an exploratory experiment is marked by the absence of an "explicit hypothesis"), although he has stressed this particular aspect of the exploratory

experiment elsewhere in the book. The second chapter on 'Conducting Experiments' starts with a discussion of the "formulation of the problem", presents a number of related concepts, and ends up with the 'treatment of result'. The chapter seems to have been designed on the model of the 'Experimental Plan' of McGuigan's book but lacks its brevity of style and, to some extent, its coherence of ideas—a balance attained in McGuigan's writing. The detailed treatment of 'introspective data' is somewhat surprising, particularly when the author himself observes that "in most experiments reported in standard journals you do not come across the subject's introspective report". To say in the same breath that "introspective data are not essential data" and also that they are useful for the purpose of understanding certain aspects of the result which cannot be explained otherwise, is somewhat puzzling. The third chapter on 'Reporting an Experiment' contains a 'Model Report' and a 'review' of it. This chapter is very clearly written and will certainly help students who are not well-acquainted with the technicalities of scientific report-writing.

The fourth chapter, the longest in the book, deals with psychophysical experiments and includes the traditional methods that are usually placed under this category. The experimental illustrations are well-conceived and lucidly expressed. It is, however, surprising that a book written as late as 1975 should omit 'Stevens' power law' and stop at the verification of the Weber-Fechner law. Experimental illustrations of 'contemporary relevance of the psychophysical methods' (e.g. the Signal Detection Theory) so clearly brought out by Plutchik (1968) or D'amato (1970) are also missing in Dr. Mohsin's book. A book addressed to post-graduate students ought to have included a discussion of the methods of paired comparison (of which the method of constant stimuli is only an extension), rank order and some other scaling techniques as found in the books of Guilford (1954), Woodworth & Scholsberg (1955) or Plutchik (1968).

Each of the remaining chapters has been devoted to experiments related to a distinct area of psychology. In the sequential arrangement of the experiments the book is noted to have followed the order that is preferred by recently published manuals like those of Heckman & Fried (1965) or DeBold (1968). The experiments placed under different chapters are, barring a few, judiciously chosen and carefully written. However, some of the experiments like the one on 'Mirror Tracing' (Chap. 7) and that on 'Transfer in Sensory-Motor Learning' (Chap. 9) could have interchanged positions. Similarly, the experiments on 'Perceptual Defense', which go under perception in most textbooks, have been placed under motivation without any supporting argument. Moreover, all the experiments included in the book do not seem to have received uniform treatment. Some are over-detailed (e.g. the experiments on span of attention, PI and RI, work and

fatigue, etc.) while some others seem to be inadequately described (e.g. the experiments on maze learning, perceptual defense, etc.). The style of writing, too, is uneven and in some cases, seems to have violated the conventional standards of a laboratory manual (e.g. the experiment on the Zeigarnik effect under motivation). Appendix III showing illustrations of psychological instruments could have been made more useful with some information of the accuracy, sensitivity and other specific problems of psychological instruments (as has been done in Plutchik's book).

The absence of a clear division, or of any principle thereof, between the experiments meant for the undergraduate and post-graduate students is rather unexpected. But more unexpected and somewhat disappointing is the total omission of experiments on intelligence, special aptitude and personality traits. On both counts, the book written by Parameswaran & Rao (1968) is more complete and satisfying.

There are several printing errors in the book which a more careful proof-reading could have avoided. The repeated occurrence of the word 'alphabets' on page 139 is rather odd.

Notwithstanding these comments, some of which may appear too fastidious, the reviewer is convinced that Dr. Mohsin's book is a commendable work in a relatively neglected field. The book has been able to demonstrate how the apparently discrete and unrelated areas of experimentation can be connected by the common thread of experimental methodology. The integration of methodology with experiments of diverse kinds seems to be the chief merit of the book. Appendix I on group-experiments and Appendix II with its suggested list of additional experiments have definitely added to the value of the book.

When one compares the present manual with those published by some other Indian authors (e.g. Jalota, Kuppuswamy, Mukherjee, Parameswaran & Rao) one has to admit that Dr. Mohsin's book belongs to a different class. This is true in spite of the pitfalls mentioned earlier. Some of the manuals published abroad like those of Heckman & Fried (1965) or De-Bold (1968) are also found to fall short of the standard attained by Dr. Mohsin's book. Dr. Mohsin evidently did not want his book to be merely a guide to laboratory work. He has tried to present the methodological foundation of the psychological experiments usually conducted in a laboratory. This combination has given the book freshness and distinction.

The National Book Trust must be thanked for subsidizing the cost of publication in order to make the book available at a low price.

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Association of Indian Universities 1925—75

S.S. Bhandarkar, published by the Association of Indian Universities, Rouse Avenue, New Delhi, (1975) pages 227, price Rs. 50/-.

Mr. Bhandarkar in his work traces the history of the Inter-University Board, now called the Association of Indian Universities. This organization celebrated its golden jubilee in 1975 and it becomes incumbent to review its working in the last 50 years so as to pinpoint its achievements and failures. In this context, the work is very timely.

Prior to the formation of the Association, Indian universities were functioning in isolation. Academicians felt the need for a coordinating body which would provide a forum for the discussion of problems of common interest, which would make known experiments and solutions attempted in different universities, and thereby initiate a national dialogue on problems of educational policy. With this end in view, the Inter-University Board was created on March 23, 1925.

In the initial phase of its development, the Inter-University Board depended upon the support lent by Vice-Chancellors and some eminent educationists and its activities also remained very restrictive. It, therefore, earned the title of 'Vice-Chancellors' Club'. It held quinquennial conferences which provided a useful forum for the expression of different points of view on university problems. Eventually, the Inter-University Board came to be recognized as the central organisation of Indian universities. It received recognition from the Government too and its functions became more clearly defined. With an increase in the number of universities, the membership of the Board also increased. In 1963, the membership rose to 48. It may be recorded that it started with a membership of 11. Among the luminaries in the field of education who contributed to the development of the Board, mention must be made of the following : Sir A. Lakshmanaswami Mudaliar, Sir Maurice Gwyer, Sir C.P. Ramaswamy Aiyar, Dr. Amarnath Jha, Dr. Zakir Hussain, Prof. P.A. Wadia and Dr. C.D. Deshmukh. It was Dr. C.D. Deshmukh who gave the IUB its motto संघात् सञ्जायते सन्धिः : 'From association is born integration'. In 1967, Dr. Amrik Singh got the Board registered as a Society under the Societies Registration Act. As a consequence, the scope of the work of the Board expanded and the changes were incorporated in the Memorandum of Association :

1. To serve as an inter-university organization ;
2. to act as a bureau of information and to facilitate communication, coordination and mutual consultation among universities ;
3. to act as a liaison between the universities and the government (Central as well as the State Governments) and to cooperate with other universities or bodies (national or international) in matters of common interest ;
4. to act as the representative of the universities of India and Ceylon ;
5. to promote or to undertake such programmes as would help to improve standards of instruction, examination, research, textbooks, scholarly publications, library, organization and such other programmes as may contribute to the growth and propagation of knowledge ;
6. to help universities to maintain their autonomous character ;
7. to do, or get done, all such other acts and things, as are conducive or incidental to the attainment of the objects of the Board ;
8. to facilitate exchange of members of the teaching and research staff ;
9. to appoint or recommend where necessary a common representative of the Board at any conference, national or international, on higher education ;
10. to assist universities in obtaining recognition for their degrees, diplomas and examinations from other universities, Indian as well as foreign ;
11. to undertake, organize and facilitate conferences, seminars, workshops, lectures and research in higher learning ;
12. to establish and maintain a sports organization for promoting sports among member universities ;
13. to establish and maintain organizations dealing with youth welfare, student services, cultural programmes, adult education and such other activities as are conducive to the betterment and welfare of students or teachers and others connected with universities ;
14. to act as a service agency to universities in whatever manner it may be required or prescribed ;
15. to undertake, facilitate and provide for the publication of newsletters, research papers, books and journals.

The IUB has all along been acting as a coordinating agency of Indian universities. For this purpose, the Board made a strong plea for the creation of the University Grants Commission on the lines of the Commission working in Great Britain. Thus, the birth of the UGC in 1956 can be traced to the efforts of the Inter-University Board. Among the other

notable achievements of the Board can be listed the Seminar on University Governance (1969) held in Vallabh Vidyanagar, the Seminar on Examination Reforms (1970) held in Madurai and the Seminar on Coordinating of agencies in Higher Education (1970) held in Patna and the seminar on Examinations (1971) held in Delhi. The reports of these seminars reflect the essence of the thinking of the leading Indian educationists. Besides, the IUB brings out every year the Universities Handbook which serves as a useful digest of information on universities in India and Ceylon. Recently, the AIU has also created a Research Cell.

Being a voluntary professional organization, the Association of Indian Universities does not possess any statutory powers to enforce the recommendations which are made at the seminars and conferences held under its auspices. Neither is it the intention of the AIU to intrude upon the autonomy of the universities.

The Association is very cautious that it does not violate the principle of university autonomy but at the same time it has always endeavoured to promote discussion on issues of national interest and thus create a climate in which the universities would themselves agree to its recommendations.

One of the charges against the AIU was that it became the 'Vice-Chancellors' club' and that its deliberations were dominated by those representing the top echelons of the university community. This irked those who believed that the opinions and suggestions of junior teachers should not be ignored. More recently, the seminars and conferences organized by the AIU have drawn from all cadres of the university community and in this sense, the deliberations of the AIU are becoming more and more representative of the thinking of the university community as a whole, and not of a coterie of top university academician-administrators.

With the creation of the UGC in 1956 there has been a shift of emphasis by the universities from the activities of the AIU towards UGC. This was a natural outcome because the UGC is concerned with the provision of grants to all universities. Also, the UGC Act lays down that it is also responsible for the improvement of standards in higher education. Therefore, the UGC also helps the universities to organize seminars, conferences, etc. This has resulted in a limited role for the AIU as a coordinating agency. However, it must be emphasized, as has been done by the author, that the AIU was the first agency to break up the isolationism of the universities and bring them to a common platform. Moreover, being a non-government voluntary professional organization, the AIU need not always act as the mouthpiece of the State. Such a voluntary organization alone, especially at present when the mechanism of grants is being used to erode university autonomy, can become the custodian of academic freedom.

One of the difficulties which the AIU has to face is to find resources for

its growing activities. Its finances mainly consist of contributions from the universities, sale of the University Handbook and some other published material and occasional grants from the Government. The resources are quite inadequate to meet its needs. It is essential that either the UGC or the Government place at the disposal of the AIU funds for carrying out its activities, but care must be taken that the organization keeps clear of State control.

Bhandarkar's book is a welcome addition to the literature on higher education, especially on the role of the Association of Indian Universities. He has traced the history and achievements of this voluntary professional organization and enunciated its future roles. There is no doubt that in order to develop democratic academic institutions, organizations like the AIU must be strengthened. Mr. Bhandarkar's book is timely and analytical.

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Science Achievement in Australian Secondary Schools—Some School Results from the I.E.A. Science Project

Malcolm J. Rosier, Australian Council for Educational Research, 1973

THIS book is addressed to the teachers of science and the headmasters of the schools that formed part of the sample in the study 'Science Education in Nineteen countries' by the International Association for the Evaluation of Educational Achievement (IEA). The author himself points out that "the main purpose of this report is to provide Australian schools that participated in the project with some of their school results so that they can compare their performance with that of other schools in their State." The author has taken great pains, therefore, to eliminate the language of statistics.

It is not very clear why the positions of the schools are shown on bivariate charts.* The schools would be interested in their relative positions

*Bivariate charts are split over six districts of the country and show different relationships between variables over the States.

with regard to means and the four bivariate charts involving five variables (Science Achievement is constant in each graph) are likely to leave them confused. The author has hesitated to use the language of statistics but has tried to communicate the ideas and applications with the help of figures and diagrams. In the absence of plotted confidence bands around the means, it seems unlikely that the teachers could resist the temptation of making comparisons on stated point values. It is not clear what use the schools can make of the correlations reported by the provinces. The author's silence about the meaning and significance of differences between the correlation—most of the obtained differences being attributable to sampling fluctuations from a population value—can confuse the readers.

The book has little to communicate to anyone but the headmasters/teachers of the schools that participated in the study. The author refrains from commenting on the information in the appendices which could have been of some interest to foreign readers. Forty-eight pages of scattergrams out of 61 pages of the total writing (minus appendices) leave the reader a bit irritated. The author's determined silence on any interpretation tends to make matters worse.

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Research on Examinations in India

A.E. Harper Jr. & V.S. Misra, NCERT, Jan, 1976; 318 pages, Rs. 30/-

A nearly foregone and oft-quoted conclusion that—the system of examinations current in our country is useless—has been reiterated by two large and systematic studies on the reliability of examination marks. The studies have been conducted by an eminent psychometrician like Dr. A. E. Harper Jr. and his collaborator Dr. V. S. Misra, at one time Head of Examination Research at Gauhati University and presently a Deputy Secretary in the UPSC. Dr. Harper Jr, Director of the Bureau of Educational Research, Ewing Christian College, Allahabad, is the founder of the Psychometric

Unit of the Indian Statistical Institute in Calcutta. He is an American born in India and has spent most of his life here. He is more of an Indian than most Indians and is the first American to have courted arrest during our freedom struggle.

There have been numerous researches on examination systems in Europe and America. The publishers' blurb on the jacket flap devotes some space in justifying a seemingly repetitious work with a somewhat defensive and apologetic note. The argument in favour of doing more work in India is that the foreign countries have already adopted a different, objective type system of examinations and their conclusions ostensibly cannot be applied directly to this country; on the other hand, work done on essay type systems decades ago are "no longer widely available". Also, work done elsewhere is not convincing to workers here! The last argument seems to be applied to all kinds of educational research in India and tends to generate a series of repetitious, perennial experimentation.

The authors seem to have already felt the pulse of the Indian readers and have accordingly prepared their material in three levels: for the "impatient" they have provided the highlights and summaries. Perhaps most of the readers would stop here and pass on the book to the juniors. The second level is for those interested in the major findings but not the unwieldy details. Perhaps this category refers to persons holding high academic positions in education and allied disciplines, who still suffer from a phobia for statistical analyses and procedures. The rare third category can have all the tables, graphs, charts and procedural arguments. These probably are for the research workers not yet disillusioned by the general-purpose men who are the situation-in-charges. This way of presentation is unique, albeit a little repetitious. There are 230 references to the bibliography and the book has been thoroughly indexed. Authors in India are often not painstaking enough to add such indexes to their books.

The question of reliability of examinations in India has been tackled through two different studies, both based on the actual answer books of Class X students under a higher secondary board. The first study is called "Ninety marking ten" experiment in which ninety photographically exact copies were made of 10 history answer books which were examined by ninety different examiners. The other study is called "Four thousand examined," which took one thousand answer books each for history, Hindi, biology and mathematics. In the latter study, ten examiners for each subject were asked to mark them for a second time. Both the studies were supported by the NCERT, and they point out that the examinations are unreliable. Even grading does not seem to improve the reliability much. We cannot also trust the percentages of marks or the divisions.

Twenty-seven years ago the Radhakrishnan Commission (1950) had

described the traditional examinations as "invalid, inadequate, subjective and therefore not reliable." It has taken 25 years for us to wake up and do something for examination reform. As to when we shall start moving in the right direction is anybody's guess! This book can be an eye-opener to all concerned, if the research findings are ever taken seriously. The authors have recommended some major reforms such as eliminating the options, increasing the number of items, improving the marking instructions and adapting a statistically sound grace mark system proposed by Taylor and Tluanga (1963), based on standard error of measurement. They also want that all the routine statistics must be calculated for every examination and a programme of widespread education of teachers and the public should be taken up. A thorough revolution.

To the extent possible, these recommendations should be immediately implemented. Someone should cost-analyze *that*. These 318 pages of the book have a strength to move mountains of fossilized thinking. Only one should hope that they would be properly read.

I did not like the lexicographic gimmick of providing dictionary meanings of words as simple as "highlights" or "details" on the inner covers, not likely to confound even the inadequate lexical stock of the potential users of the book. The rest of the presentation is as neat as can be expected from the meticulous and methodical hands of Harper Jr.

C. H. K. MISRA

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Student Protest in the United States and India

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Student protest in varying forms and intensities has been a characteristic of institutions of higher learning. While all student protests have many features in common, there are also many features which vary with time and/or place. Comparative studies are useful tools in delineating these common and differentiating factors. Such knowledge provides insight not only into the phenomenon of student protest, but also into the cultures in which the protest occurs.

In this paper quantitative data concerning the general trends manifested in student protest occurring in India in 1971-72, are compared to those manifested in data collected in the United States in 1968-69. Although some difference in the time period exists, we feel that student protest in America in 1968-69 was characteristic of that four to six-year period of intense social concern by American students in which it falls, and that student protest in India in 1971-72 was equally representative of that same time span in India.

INDIAN EDUCATIONAL REVIEW

HIGHER EDUCATION in India and the United States is strikingly dissimilar. In India, the institutions of higher learning are highly politicized. In most cases the head of the university is appointed by the government and some administrators and faculty members obtain their jobs and promotions solely through the route of favouritism (Cormack, 1969). Each year political pressure forces the institutions to admit more students, while the facilities become increasingly inadequate. The lecture-examination method of instruction, as it is presently functioning, is generally inadequate for the transfer of knowledge and is often viewed as "impersonal" by the students. The curriculum is quite rigid and students, particularly with liberal arts degrees, find it hard to obtain suitable work. All these factors and more impinge on the relatively young students (freshmen usually enter at 16 or 17) within a context of the frustration felt by the total society as they try to meld eastern traditions with western modernity. In the United States, on the other hand, institutions of higher learning were relatively autonomous within the society and very affluent during this time period. More students, both in hard numbers and in percentages, were getting education of a better quality. The emphasis was on learning, and most student could look forward to a "good job" after graduation. The picture, however, was not totally rose tinted; there were problems in the society. Students became concerned about these problems and began to actively advocate issue-positions. By 1968-69 the United States witnessed a surge of student protest by a significant minority of its students.

The commonalities in student protest in these two situations are seen mainly in the mode students used in making their concerns and desires known; the differentiating factors within these protests are the differing focus and emphasis put on the various components of this mode of protest in each country.

METHODOLOGY

A content analysis based on the same code, with minor revisions, and the same dictionary was used to gather the American and Indian data. The content analysis was based on publicly circulated print media, i.e. newspapers. The procedure for the content analysis was also similar. First, articles concerning student unrest were identified. Then, the content of these articles was read and recorded on worksheets in a systematic way based on the definitions and procedures outlined in the code dictionary. Finally, the information was transferred to computer cards, and analysis done using the Statistical Package for the Social Sciences (Nie, Bent, and Hull, 1970).

The code was designed to gather data on the process of protest by

American students. The term 'process' is meant to refer to what actually occurs when students protest—the who, what, where, how, and when. The coding unit used was the incident. It was defined as a discrete action by one or more people involved in a protest (whether as initiators or respondents). For example, a strike, a riot, a police action, a teach-in (in the United States), and gheraoing (in India) are all considered incidents (for a more detailed list of incidents see Table 4). For each incident information concerning the issue, who and how many initiated the incident, how long it lasted, what relation the incident had to other incidents, where it occurred, how much violence existed (if any), who made a response, and, if educational administrators responded, how they responded, was recorded if it appeared in the article reporting the incident.

The Indian data was gathered from seven major English language newspapers. The sample of articles to be coded was taken from the 'Higher Education' clipping file in the New Delhi office of the University Grants Commission. One coder who coded 561 incidents over 15 months during 1970-71, was employed.

The American data was gathered from the *New York Times*, the only daily newspaper in America with a nationwide circulation and a tradition of comprehensive reporting (Merrill, 1968). The sample of articles was taken directly from the newspaper, and the period for coding was December, 1968, through February, 1969. During this three-month period 1,744 incidents were coded. A team of three coders was used for data-gathering with a reliability score of 90 (using the Spearman-Brown Formula) maintained throughout (Holsti, 1969).

While each data collection had its own unique characteristics, within the common procedures outlined above, the level of specificity of this paper makes most of them of only tangential interest. Therefore, it seems necessary to point out only one factor at this time which seems to significantly influence the context of this report. This factor involves the difference in the number of incidents coded in India and America. Because different coders were used in the two data collections, a general evaluation of the coding itself was done. In this evaluation, strong indications suggested that the Indian coder did not code incidents which would have been coded by the American team. This factor, then, can be used as a partial explanation for the relatively small number of incidents coded in India. Also, it is possible that the clipping file used in India did not contain all the pertinent clippings. These are only partial explanations, however, and the vast difference cannot be totally discounted. In fact, the first general comparative trend would seem to be that Indian student protest during this period occurred with less frequency than American student protest. Looking at the history of student protest in the two countries, this does not seem to be too unusual. In India

1970-71 was much like 1966 which was much like 1959 as far as the level of student protest was concerned (Altbach, 1966; Cormack, 1961). Student protest seems to have been very much the same since the independence movement in 1947. In America, on the other hand, the protest of 1968-69 was reaching a peak in numbers and intensity not seen since the 1930's.

RESULTS

Issue Content and Scope

A comparison of the 'issue content' coded for the protest incidents reported in India and in America provide an interesting introduction to the data. An hypothesis concerning the major types of student protest which have occurred throughout history has been used to analyze the data. This hypothesis is that students protest about three generalized issues:

- a) Students protest about the problems and difficulties they face in the town/area in which they must live to attend the school. This area might also include conflicts between the school and the society concerning the intellectual and functional autonomy of the institution. In Europe and America these concerns are often called Town and Gown issues. In India, this type of concern is manifested in the bus service difficulties caused by Delhi students.
- b) Students protest about policies and decisions made within the institution by the faculty, administration, or other students. The American issue of educational reform and the Indian issues concerning the examination system provide good, general examples of this type of concern.
- c) Students protest about issues of broad concern to society. The issues of the revolutions of 1848 in Europe are of this general type as were the minority issues in America and anti-war issues throughout the world (Power and Ross). Table 1 shows the individual issues of student protest in India and America within this conceptual scheme.

It is interesting to note that, even though the situations in the two countries are very different, issues involving decisions within the institution are approximately equal. Within this category, another factor should be noted which strongly characterizes the Indian unrest : 31.3 per cent of the Indian protest was concerned with educational issues. Finally, within the general trend toward less student protest in India than in America (as discussed above), the differences in the situations seem to be reflected in the greater concern

STUDENT PROTEST IN USA AND INDIA

TABLE 1
COMPARISON OF INDIAN AND AMERICAN ISSUE CONCERNS

<i>Indian Data</i>		<i>American Data</i>	
I.	Town and Gown Issues	I.	Town and Gown Issues
	Local Problems 4.8%		Local Problems 1.1%
	Bus Service 12.7		
	Train Service 2.5		
	*Government Policies .7		
	Police Brutality 4.3		
	**Education, Language (1/3) 3.3		
	Subtotal 28.3%		Subtotal 1.1%
II.	Issues Within the Institution	II.	Issues Within the Institution
	Campus Problems 10.2%		Campus problems 17.3%
	Education, Exams 10.9		Educational Reform 4.7
	Education, General 10.5		Student Power 9.8
	Education, Language (1/3) 3.3		
	Student Suspension 2.0		
	Univ. Administrative Action 1.2		
	Subtotal 38.1%		Subtotal 31.8%
III.	Issues of Social Concern	III.	Issues of Social Concern
	Anti-Government, Foreign 2.9%		Anti-Government, Foreign .1%
	Anti-Foreign Government 1.1		Anti-Foreign Government .8
	Caste Problems 1.6		Anti-Government, American 2.5
	Political Involvement 1.6		Racial Injustice 5.6
	Naxalite Activity 1.4		Minority Studies Departments 5.6
	Freedom of the Press .9		Black Power 22.9
	Religion .4		Third World Power 4.3
	***Border Dispute .9		Anti-Recruiter 3.3
	Education, Language (1/3) 3.3		Anti-War American 2.2
			Reserve Officer Training Corps 2.8
	Subtotal 14.1%		Subtotal 45.0%
IV.	Other Issues	IV.	Other Issues
	Other 17.3%		Other 3.8%
	Death 2.5		Missing 18.6
	Subtotal 19.8%		Subtotal 22.4%

*"Government Policies" was included within the Town and Gown Issues because the vast majority of the policies were policies of the regional governments rather than the national government.

**"Education, Language" total percentage has been divided into thirds and placed in each of the three divisions because it was considered to have characteristics of identity with all three issue groupings. That is, the language of instruction issue is of concern to the local areas and regions because some are proponents of using the local language as the language of instruction. It is also of national, social concern since the academic

(Contd. on page 6)

about Town and Gown issues in India and for Social Concerns in the United States.

The coding of the 'scope of the issue' (Table 2) generally seems to support the division of student concerns pointed out in Table 1, i.e. the relatively large interest of Indian students in Town and Gown issues contrasting with the relatively large interest of American students in issues of Social Concern. For coding purposes, 'scope' refers to the general geographical area—campus, local, or national-international—where the issue was focused, i.e. at what general level of the society are the ramifications of the issue being dealt with by the students.

TABLE 2
COMPARISON OF THE SCOPE OF
AMERICAN AND INDIAN ISSUES

<i>Scope of Issue</i>	<i>Indian Data (%)</i>	<i>American Data (%)</i>
Campus	54.0%	16.7%
Local	38.9	.1
Campus & Local	.9	.9
National-International	5.3	1.4
Local & National-International	.9	.2
Campus & National-International	--	62.0
Campus, Local & National-International	--	.5
Unknown	--	18.1

In India most issues (93.8%) had a campus or local scope with a slightly heavier concentration on campus concerns than local concerns (54.0% vs. 38.9%). Issues with a campus and national-international scope or only a national-international scope (63.4%) dominate the United States student protest mirroring the large component of Social Concerns with national implications identified in the issue content analysis.

Student Position on the Issue

Another way to compare the protest of American and Indian students is

(Contd. from page 5)

language most relied upon is English, and its usage is fraught with connotations for this ex-British colony. At the same time Hindi is the official language of the country. Finally, it is an issue within the institution because, since they must make use of the decision, they are vitally involved in what is decided.

****"Border Dispute" referred to a dispute with Pakistan and thus was considered national.

STUDENT PROTEST IN USA AND INDIA

to examine the focus of their protest in relation to educational administrators, governmental and other administrators, and other students. These people, being decision-makers in the society and potential compatriots, can be considered the target population against whom the protest is launched, i.e. these are the people who can implement action concerning the issue which is in harmony with the views of the protesters. As we saw, Americans and Indians differed with regard to issue content and scope of the issue. Likewise, there were marked differences in their positions on these issues with respect to administrators and other students. Table 3 shows the comparison of the American and Indian data on the students' positions on the issues.

TABLE 3
COMPARISON OF AMERICAN AND INDIAN DATA
ON THE STUDENTS' POSITIONS ON THE ISSUES

<i>Students' Position on the Issue</i>	<i>Indian Data (%)</i>	<i>American Data (%)</i>
Support Administration	.5%	2.0%
Against Administration	9.8	51.8
Support Extra-Administration	5.2	.7
Against Extra-Administration	17.8	5.7
Support Students	.2	1.4
Against Students	1.6	4.0
Student Initiated	60.2	2.8
Unknown	4.8	31.6

In America, where social concerns of national-international scope were the predominant issues, the students' positions were most often coded against the *educational* administrators (51.8%). In India, where student issue-concern was centered on 'town and gown' issues and decision-making within the institution, most student positions on the issue were coded independently: i.e. student initiated (60.2%), and the second most coded student position was against the *extra-administration* (17.8%). It seems tactically strange that students in the United States would focus the majority of their actions against educational administrators when the majority of their concerns needed to be dealt with by decisions on a national level and that Indian students whose concerns were of a local and campus nature would not relate those concerns more directly to educational administrators. Perhaps in the United States the identification of the educational administration as the major opponent can be explained by the student concern that their campus-home should be the first to reflect the ideals they hold for the nation. In India, the student independence in asserting issues they are concerned about

in relation to no opponent or decision-maker seems to reflect a perceived 'aloneness' of the Indian students in their concern for the issues. More research needs to be done in this area of apparent paradox.

Type of Incident

Turning to what actually occurred during the student protests, the 'types of incidents' coded in India and the United States were examined. As in the case of issue content, the data has been reformed into general categories for easier analysis. Six general categories have been identified. Four of these categories classify the incidents most often initiated by students according to the method by which they communicated their concerns. (Table 4). The data included in the other two categories used for this analysis are shown in Table 5. One category is reserved for authority actions, while the second category includes miscellaneous types of incidents which were initiated by either students or authorities.

For purposes of this analysis, it was assumed that students who protest in order to express their concerns about certain issues, communicate their concern in at least four major ways. First, they try to articulate their position on the issue and what they intend to do to advocate that issue through 'direct communication', i.e. by means of leaflets, confrontations, gheraoing threats and comments. Second, through 'advocacy-action' types of incidents students attempt to show the intensity of their concern to the society around them. Third, as larger numbers of people gather to advocate issues, and the emotion and activity intensify, occasionally the enthusiasm will spill over into the initiation of 'pranks' which have no real relation to the concerns at hand but are a product of the rising momentum. The fourth category through which the students attempt to communicate their concerns is by 'frustration-level' types of incidents. These incidents seem to occur most often when advocacy-action incidents are ignored or when the response to the advocacy is repressive, i.e. when the students' attempt to communicate—and, hopefully, to change the situation—is rebuffed or ignored.

The types of incidents which the authorities most often initiated are not as easily subdivided into categories based on the function of their communication. The difficulty encountered in the attempt at such a subdivision is probably due to at least three factors. First, within the context of student protest, authority action is most often reactive. A characteristic of such reactive actions may be that they have more limited communicative functions and/or that they are more specifically designed for each situation. The second possible explanation for the difficulty in attempting a more detailed analysis of authority-initiated actions is that not enough incidents have been

observed for the development of a subdividing concept. The third possible explanation is that the source of the data, i.e. the newspapers, did not have access to or did not report the full spectrum of authority-actions. More work on the analysis of authority-actions during student protest and their functions is needed.

Table 4 is a comparison of the frequency of the varying types of incidents in the United States and Indian data which were initiated by students as they were reformed into the general categories outlined above. Table 5 shows the frequency of the various types of incidents usually initiated by the authorities, as well as the frequency of those types of incidents which did not easily fit into one of the other five categories.

A most interesting result of the imposed categorization is the similarity in the proportions of incidents falling in each category. Attempts at direct communication represent approximately 20.0% of the total amount of protest, advocacy-action types of events approximately 30.0%, pranks approximately 1.0%, and authority-actions approximately 32.0%. The exceptions to this similarity between the categories are the relatively large differences between American and Indian protest in the number of incidents falling in the frustration-level category and miscellaneous category. The higher frequency of frustration-level incidents in India is most likely a reflection of the high general level of frustration often referred to as a characteristic of Indian higher education and the more frequent involvement of police in confrontations (see discussion of police involvement which follows) there by expressing the society's rejection of the students' concern and thus leading to more frustration. Note having been taken of the exceptions, however, the general similarities between Indian and United States protest which this categorization reveals may be the beginning of an understanding of what is generally involved in the communication of concerns by means of protest and in what proportions they are usually employed.

A second interesting finding which is revealed in Table 4 concerns the discovery of types of incidents which occur in only one of the countries. These incidents seem to be manifestations of the differing tactics, norms, and societal realities of the two countries. The incidents which seem unique to the United States are the teach-in, guerilla theatre, rock festival, and the 'state of emergency'. In India there are also incidents occurring only in that country: abstaining from classes, the lathi charge and gheraoing. The definition of each of these six incidents will follow with an explanation of their uniqueness where such an explanation seems apparent at this time:

1) *Teach-in*: American. This student tactic involves presenting a series of expert speakers, meetings, and discussions in order to explore an issue in depth and educate the public about why the issue is important. It

TABLE 4
COMPARISON OF THE FREQUENCY OF THE TYPES OF INCIDENTS
INITIATED BY STUDENTS AS FOUND IN THE INDIAN AND
AMERICAN DATA

<i>Type of Incident</i>	<i>Indian Data</i>	<i>American Data</i>
I. <i>Attempts at Direct Communication</i>		
Leaflet, Picket (1/2),* Petition	.9%	1.85%
Confrontation (1/2)	1.9	.45
Teach-in	--	.3
Present Demands	11.7	2.1
Guerilla Theatre, Rock Festival	--	.2
Speech	.2	1.0
Gherao (1/2)	1.1	--
Harassment (1/2)	.85	.7
Comments (1/2), Threats	2.65	14.1
Subtotal	19.3%	20.7%
II. <i>Advocacy Action Types of Incidents</i>		
March	.5%	1.9%
Strike (including hunger strikes)	9.7	.9
Abstaining from Classes	2.2	--
Occupation	1.7	3.0
Class Disruption	.5	1.7
Demonstration	8.4	1.5
Block Entrance	.2	1.4
Rally, Meeting	3.9	9.9
Convention	.2	.1
Vote	.2	3.7
Picketing (1/2)	.3	.65
Harassment (1/2)	.85	.7
Confrontation (1/2)	1.9	.45
Gherao (1/2)	1.1	--
Attack Bus	1.3	--
Subtotal	32.95%	26.9%
III. <i>Pranks</i>		
Stealing	.3%	.1%
General Disruption	1.1	.4
Subtotal	1.4%	.5%

*In cases where an incident had components of more than one general category, its frequency was proportioned equally between the categories.

STUDENT PROTEST IN USA AND INDIA

IV. <i>Frustration-Level Types of Incidents</i>		
Bombing	.3%	.9%
Riot	2.9	.5
Destruction	1.0	.8
Death and Injury	2.0	.5
Subtotal	6.2%	2.7%

TABLE 5
COMPARISON OF THE FREQUENCY OF AUTHORITY ACTIONS AND
MISCELLANEOUS TYPES OF INCIDENTS AS FOUND IN THE INDIAN
AND AMERICAN DATA

<i>Type of Incident</i>	<i>Indian Data</i>	<i>American Data</i>
I. <i>Authority Actions</i>		
Not Rehired	.6%	.1%
Resignation	.2	.2
Authority Action	20.2	18.2
Guarding	.3	1.1
Mobilizing Forces	.2	.5
Lathi Charge	2.3	--
State of Emergency	--	.1
Close School	5.5	.3
Reopen School	.5	.2
Comments (1/2)	2.05	14.1
Subtotal	31.85%	34.8%
II. <i>Miscellaneous Types of Incidents</i>		
Withdrawal	1.1%	3.6%
Group Formed	.2	.7
Report	.2	1.4
Decide Action	.5	--
Other	5.5	9.6
Subtotal	7.5%	15.3%

usually takes place on campus and involves the faculty heavily as speakers and discussion leaders.

2) *Guerilla Theatre*: American. Student protesters sometimes attempt to communicate the drama they see within their issues by creating short plays to be acted out with minimal costumes and props on the streets and in public. Many of these plays in the late 60's and early 70's depicted American killings in Vietnam.

3) *Rock Festival*: American. During the late 60's and early 70's in

the United States, 'rock festivals' became very popular. These festivals were built around the performances of groups playing rock music and appearing over an extended period of time; usually one, two, or three days. Great numbers of young people—many of whom were activist students—attended these festivals and occasionally the festivals were identified with student issues as a type of mass statement on an issue. The Woodstock rock festival which became identified with a pacifistic statement by youth in general and students in particular is an example of this phenomenon.

4) *State of Emergency* : American. This tactic is used by authorities/administrators. It is a formal call for readiness—but not action—on the part of police agencies.

5) *Abstaining from Classes* : Indian. Students abstaining from classes is distinguishable in the Indian data from a student strike, although they both essentially involve staying away from class. It seems that this tactic serves at least two functions; to test student involvement in preparation for calling a strike, and/or as a strike, but with a lesser degree of concern/commitment.

6) *Lathi Charge* : Indian. This police tactic's name comes from the bamboo sticks (the Indian equivalent of the American riot stick) the police carry; the tactic involves rushing at protesters swinging these sticks. Although this sometimes occurs in America, there is no name or term for the action. The lack of an American word or phrase for such a happening is probably a reflection of the relatively low frequency of this tactic's occurrence in the United States.

7) *Gheraoing* : Indian. This student tactic involves invading an office or room occupied by an authority or administrator, and not allowing the authority or administrator to leave until he has agreed to meet the students' demands or at least to negotiate with them. While this has occurred a few times in America (Columbia, 1968; Harvard, 1969) it is certainly not as common a practice as it seems to be in India.

Location and Duration of Incidents

Table 6 shows the comparison of the sites of Indian and American incidents.

As one would expect, protest incidents in both India and United States most often occurred locally (92.6% in India and 87.2% in the United States). The contrast between the situation in India and the United States is shown in the amount of this local protest occurring off-campus in India (41.4%) and in the United States (8.0%).

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TABLE 6
COMPARISON OF THE SITE OF INCIDENT AS
CODED IN INDIAN AND AMERICAN DATA

<i>Site of Incident</i>	<i>Indian Data</i>	<i>American Data</i>
	54.2%	79.2%
Local, on campus	41.4	8.0
Local, off campus	--	.2
Regional, on campus	.4	3.3
Regional, off campus	--	.8
National, on campus	1.4	1.4
National, off campus	1.8	2.1
Local, on and off campus	.9	4.9
Unknown		

The duration of the incidents is shown in Table 7:

TABLE 7
COMPARISON OF DURATION [OF INCIDENTS
IN INDIAN AND AMERICAN DATA

<i>Duration of Incident</i>	<i>Indian Data</i>	<i>American Data</i>
	86.5%	89.0%
1 Day or less	2.5	1.4
2-7 Days	.4	.1
8-14 Days	.4	.2
15-30 Days	.4	.1
More than 30 Days	10.0	9.2
Unknown		

In both sets of data, one day or less was the most often coded duration (86.5% in India and 89.0% in America). This finding is at least partly related to the definition of the coding unit. It is interesting to note, however, that in India the frequency of incidents with durations longer than one day was consistently higher than in the United States.

Confrontation in the Incidents

As a final word concerning the protest incidents themselves, a rough measurement was attempted of the amount of confrontation exhibited in these incidents. If the level of confrontation of a protest can be determined

by the frequency of demands, the amount of violence, and police presence, it can be said that Indian student protest showed, on the whole, greater confrontation than American student protest. In India 14.3% of the incidents had articulated demands relating to them, while in the United States 8.8% of the incidents carried with them a list of demands. Police or the military were present in 13.6% of the incidents in India, but in only 6.1% of the incidents in the United States. Finally, violence occurred to property or people in 23.2% of the incidents in India and only 3.9% of the incidents in the United States.

Student-Faculty Involvement in Incidents

Table 8 shows a comparison of the frequency of incidents in India and the United States involving specified numbers of students.

TABLE 8
COMPARISON OF THE NUMBER OF STUDENTS REPORTED AS
INVOLVED IN PROTEST INCIDENTS IN INDIA AND
AMERICA

<i>No. of Students Involved</i>	<i>Indian Data (%)</i>	<i>American Data (%)</i>
1-24	8.9%	13.4%
25-99	2.1	4.0
100-499	4.3	6.6
500-999	.9	1.7
1000-5000	2.0	1.6
5000+	.4	--
Unknown	66.3	23.2
No Information	15.3	49.5

If those incidents where the report referred to an unspecified number of students or where no information as to the number of students was given are disregarded (approximately 70.0%), it is interesting to note another general similarity between the United States and Indian data. In both sets of data a higher frequency of incidents had 1-24, 100-499, or 1000-5000 students involved while a lower frequency of incidents had 25-99, 500-999, or 5000 students involved. If these data are representative of what occurs during student protest, then it is possible that these numbers indicate general trends toward group size in student protest. This must be recognized as a very tentative conclusion, however, since it is based on such a relatively small

The findings show that in both India and the United States there are three groups which together make up approximately 70.0% of the responses to student protest. They are administration (India 27.5%, United States 26.3%), police (India 26.6%, United States 14.5%), and students (India-20.3%, United States-27.2%).

Table 10 looks more closely at the response of educational administrators to student protest. The first four categories—major responsive, minor responsive, major repressive, minor repressive—refer to the types of action taken, the next three to the type of comments made, and the last two to special types of responses (i.e. the decision not to respond or to negotiate).

TABLE 10
COMPARISON OF THE TYPES OF ADMINISTRATIVE
RESPONSE IN INDIA AND AMERICA

<i>Administrative Response</i>	<i>Indian Data (%)</i>	<i>American Data (%)</i>
Major Responsive	4.2	15.5
Minor Responsive	11.1	10.5
Major Repressive	61.1	10.5
Minor Repressive	9.7	9.0
Comments, Positive	4.2	8.5
Comments, Negative	1.4	21.0
Comments, General	5.6	16.5
No Response	2.8	2.5
Negotiating	—	6.0

Repressive actions on the part of Indian administrators accounted for 70.8% of their responses, 15.3% of the remaining responses were actions determined to be responsive to the student protest. These were the two highest categories of response. The response of American educational administrators is in sharp contrast to that of their Indian counterparts. In the American data the largest proportion of responses fell into the general category of comments (46.0%) and the second largest proportion was responsive actions (26.0%).

CONCLUSIONS

An examination of contemporary student protest in America and in India reveals that each has a distinctive character within the general similarities of such protest actions. In both countries student protests involved

STUDENT PROTEST IN USA AND INDIA

issues concerning the institution for approximately 30.0% of their protests (Table 1). In American protests, however, the major issue concerns were social concerns with a national scope (45.0%). On the other hand, Indian student protests were distinctive in the large amount of concern for 'town and gown' issues with a local scope (28.3%). These findings indicate the general areas of concern for Indian and American students.

Some of the similarities in the ways in which the students made these concerns known had perhaps gone unnoticed before. First, students do not seem to deal with these issues in relation to the authorities or administrators who could be most useful in effecting change (Table 3). Second, the classification of the different types of incidents occurring in protest situations indicates that protest may involve similar proportions of these classifications regardless of the country in which it occurs (Tables 4 and 5). Third, there were some rather tenuous indications that protest groups may tend to form in certain sizes (Table 8). When contrasting Indian and American protest, it was found that Indian student protest was more violent, and was more distinctly between students and administrators or authorities. On the other hand, American student protest involved the faculty as well as students and showed lesser confrontation and violence.

The contrasts in the larger perspectives are also important to note. Indian student protest is an ongoing, constant situation, while in America student protest is more cyclic. The data reported on here had been gathered during a peak period. This overview coupled with the findings on the response of the educational administrators in the two countries may lead to an interesting hypothesis.

American administrators responded to incidents of student protest mostly verbally rather than in action, and when action did take place it was more often responsive than repressive. As with these individual incidents of student protest, the nature of administrative response from the larger perspective was also more responsive. With regard to the major concerns of students in the late 1960's progress toward their positions on the issues have been made—American involvement in the Vietnamese war has ended, the struggle of the American black for civil rights has been recognized, and the military draft has been considerably modified. Student protest in America today has greatly decreased, partly as a result of these changes.

In India, on the other hand, student protest is a constant, violent occurrence most often met with repressive action on the part of educational administrators attempting to control it. Moreover, many of the issues such as the examination system, the language of instruction, and the bus service in Delhi have been issues of concern for decades and do not seem to be dealt with or resolved by the society.

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Estimation of Small Data-Base Group Parameters Utilizing Matrix Sampling

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A researcher interested in making inferences concerning the performance of a population of people on a population of test items can choose from a number of possible strategies. This choice is governed, in part, by the question or questions one wishes to answer, the statistical assumptions accepted, the strength of statistical and/or psychometric inferences desired, and, in many practical situations, the nature of one's data. For example, the educational researcher may choose from among the following strategies.

- 1. Administer all the items to all the people. This is a census or norm.*
- 2. Administer all the items to some of the people and draw inferences concerning the performance of all the people on all items. This is the traditional focus of statistical inference in psychology and education through what is known as examinee sampling.*
- 3. Administer some of the items to all of the people and draw inferences concerning the performance of these people on all the items. This is the traditional focus of psychometric inference through what is known as traditional item sampling.*
- 4. Administer some of the people some of the time, with items and people sampled randomly and independently, and draw a statistical psychometric inference concerning the performance of all the people on all the items. This is referred to as item-examinee of matrix sampling.*

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IN EVALUATING the effectiveness of educational programmes, the relative merits of these techniques have been outlined in a number of publications, among them Shoemaker (1972a) and Glaser and Nitko (1971). Matrix sampling has certain advantages in relationship to other strategies within the framework of programme evaluation. Osburn (1968) states, quite correctly, that in the measurement of achievement one is seldom interested in the performance of subjects on just the items administered, but is concerned rather with generalizing to some larger universe of content. A major advantage of matrix sampling is a decrease in testing time per student, which goes with the possibility of generalizing over a wide content domain. Also, if estimates of performance over a large sample of items and thus over a wide content domain is obtained, a programme developer can hardly be accused of teaching to the test.

Introducing some standard notations should simplify the discussion of the research presented in this study. If K represents the total number of items in a given test and N represents the total number of examinees in the population, a $K \times N$ item-examinee matrix can be formed with KN as the total number of observations on which the population values are based. Most previous studies have examined matrices with appreciably larger N 's than are considered by this investigation.

If we let ' t ' represent the number of subtests (into which the K items are split), ' k ' the number of items per subtest and ' n ' the number of examinees responding to the subtest, a particular sampling plan from the $K \times N$ matrix can be represented by $t/k/n$. The product of $t/k/n$ is the number of observations that will be obtained from a given sampling plan. The general question in matrix sampling is to determine the most effective $t/k/n$ combination.

The primary purpose of this study was to provide an answer to a practical problem : Which, if any, sampling plans lead to accurate estimates of small data-base group parameters ? First, in the absolute sense, where small standard errors of estimate are desirable, and then in the relative sense by comparing the standard errors of estimation associated with the various plans with each other.

Principles of matrix sampling have been offered by several authors, (Shoemaker, 1971, for example). However, for the most part, these principles are based upon studies of large numbers of examinees where the primary purpose has been the development of norms. Thus the principles may not be appropriate for the situation where estimates of means and variances are desired for groups with numbers of examinees as small as the typical class size. Estimates of classroom parameters are important to the educational practitioner in that many evaluative and administrative concerns focus on the classroom unit.

ESTIMATION OF SMALL DATA-BASE GROUP PARAMETERS METHODOLOGY

Matrices

One component of the matrices examined were items from the Iowa Tests of Basic Skills (ITBS), Form Three, a widely known and widely used achievement test (Lindquist and Hieronymus, 1964). The following ITBS tests were administered: Vocabulary (114 items), Reading (178 items), Arithmetic Concepts (136 items) and Arithmetic Problem Solving (96 items). The examinees were elementary school pupils, grades three through six, from six schools engaged in a comparative study of instructional systems.

Procedure

The simulation study utilized computer-generated data bases having the values of prescribed parameters. The computer was then used to select matrix samples from the existing data base. (The matrix sampling plan is described below). The parameters were estimated, replications of the sample drawn, and the standard errors of estimation computed using Shoemaker's (1971) formula :

$$\hat{\mu}_i = \frac{K\bar{T}_i}{k_i} \quad (1)$$

$$\hat{\sigma}_i^2 = \frac{n_i K [(k-1)s^2 - (K-k_i) v_i]}{k_i(k_i-1)(n_i-1)} \quad (2)$$

where,

K = the total number of items in the population,

k_i = the number of items in subtest i ,

n_i = the number of examinees receiving subtest i ,

\bar{T}_i = the mean test score on subtest i ,

$s^2 = \sum (T - \bar{T})^2 / n$, the variance of test scores on subtest i

The results of each subtest provide an estimate of μ and σ^2 and a pooled estimate of μ and σ^2 is obtained by combining the t subtest estimates

$$\text{using } \hat{\mu}_{\text{pooled}} = \frac{\sum_{i=1}^t \hat{\mu}_i}{\sum_{i=1}^t 1} \quad (3)$$

$$\text{and } \hat{\sigma}_{\text{pooled}}^2 = \frac{\sum_{i=1}^t \hat{\sigma}_i^2}{\sum_{i=1}^t 1} \quad (4)$$

where,

$$\hat{\sigma}_i^2 = n_i k_i, \quad (5)$$

and the number of observations obtained from subtest i .

The standard error of estimate associated with each parameter was computed by the jackknife procedure. Shoemaker (1972b) presented the following description of the jackknife procedure :

The jackknife operates on a data set which has been divided into subgroups of data and gives a mean estimate of the parameter computed over subgroups and an estimate of the standard error of estimate associated with this estimator. A basic component of the jackknife is the pseudo-value associated with each subgroup which, for each subgroup is the weighted difference between the statistic computed on all the data and the statistic computed on the body of data that remains after omitting that subgroup. Because the pseudovalues are relatively independent of each other, the standard error of the statistic is computed according to the well-known formula for the standard error of a sample mean. The computations are relatively simple. Let

t = the number of subgroups,

y_{all} = the statistic computed on all the data, and

$y_{(j)}$ = the statistic computed on all the data
left after removing subgroup j .

The pseudovalues, y_{*j} are then equal to

$$y_{*j} = ty_{all} - (t-1)y_{(j)} \quad \text{for } j=1, 2, \dots, t.$$

(6)

The jackknife estimate of the parameter is equal to

$$y = (y_{*1} + y_{*2} + \dots + y_{*t}) / t \quad (7)$$

with an estimate of its variance given by

$$s^2 = \frac{\sum_{j=1}^t (y_{*j} - \bar{y}_{*j})^2}{t(t-1)} \quad (8)$$

If the statistics computed on each subgroup are weighted equally, the pseudovalues reduce algebraically to the averages for the subgroups. In this case, y_{*} is equal to y_{all} and s_{*}^2 is equal to the variance of the subgroup statistics. When the jackknife is applied to multiple matrix sampling, there are t subgroups of data but only one score for each subgroup with that score weighted according to the number of observations nk .

As noted above, most previous studies have had a large N but a small K in the KN matrix. This investigation considered a relatively smaller N and a larger K as the ITBS subtests have a large number of items. Thus, with respect to the general sampling plan $t/k/n$, k was given the closest attention here. Husek and Sirotnik (1967) stated that subtests should have at least three

ESTIMATION OF SMALL DATA-BASE GROUP PARAMETERS

items to ensure some reliability. Knapp (1968) found no differences between subtests of three, five, and seven items but his total test length was only 29 items. However, as n is necessarily small, large values of k relative to K were needed to generate a reasonable number of observations.

A systematic procedure was used in determining the specific sampling plans that were applied to the data from the first school. The values of t were two, three, four and five. It was felt that the upper limit should not exceed five if a plan were to be practically implemented in an actual school setting. If N is constant, then, as t increases, the values of n must decrease. That is, if t equals two in an actual classroom setting, it is quite probable that at least ten children would respond to each subtest. On the other hand, with t equal to five, it is unlikely that more than four or five examinees would be available to respond to a subtest. With respect to the number of items per subtest it was felt that taking roughly 50 per cent, 25 per cent and ten per cent of the total number of items from a particular *ITBS* test would serve well as a first approximation.

Table 3 presents data gathered from School One, and is illustrative of how the sampling plans were applied, as well as supplying a sample data set with specified inputs and obtained result. The specified inputs varied from class to class.

RESULTS

Table 1 provides a summary of the data across all subtests and grades, and presents the means, variances, and the standard errors of estimation of both parameters. It should be noted that while the categorization by total number of observations remains constant across subtests, the percentage of the available data base utilized varies from subtest to subtest, and is primarily a function of the number of items relative to the total number of items. The percentages vary from 16 to 83. The decision on grouping the number of observations (1400-2000, 1000-1399, and 700-999) was made to ensure that each group was based on approximately the same number of sampling plans. The estimate means across grades are difficult to interpret in terms of trends, but they do provide a frame of reference for the standard errors of estimation. Likewise, the estimated variances are provided for a frame of reference.

The data in Table 1 indicate that as the total number of observations increase the standard errors of estimation for both the mean and variance decrease. When the standard errors are viewed as a function of the number of subtests, no trends are evident. While the standard error of estimation for the mean decreases from 3.67 to 2.91 as the number of examinees increases

from five to ten, no evidence of this trend was found when the data were examined within the particular ITBS subtests when the number of examinees responding to a subtest were three, seven, and ten.

With the exception of the trend noted above, namely the standard errors of estimation of both the mean and variance decreasing with increasing numbers of observations, there was no indication that any general strategy, or more specifically, any given sampling plan, would necessarily lead to accurate approximations of both parameters. For example, if one were to consider the number of examinees to which a subtest was to be administered, Table 1 would lead to the conclusion that the larger number of examinees (ten) would lead to a smaller standard error of estimation for the mean but to a larger standard error of estimation for the variance. This type of example seemed to be the rule rather than the exception throughout the results.

Table 2 presents varying numbers of total observations and percentages of available data base by subtests across grades. The standard errors of estimation for the mean provide additional evidence that as the number of observations increases, the standard error of estimation decreases. Within each subtest this trend is evident, with the possible exception of the A-2 subtest, where the values, in terms of increases in number of observations, are 2.98, 3.00, and 2.25. While the differences between 2.98 and 3.00 is, of course, small, the standard errors of estimation for the remaining subtests confirm exactly to the trend noted above.

With respect to the standard error of estimation for the variance, the trend noted in the data from Table 1 was also evident in the data from Table 2. That is, as the number of observations increased, the standard errors of estimation decreased. This trend was consistent across all subtests with the exception of A-1, where the 62.68 and 60.56 are not arranged in the exact rank order that would conform to the trend. However, these values are smaller than the 82.51 obtained from the smaller number of observations.

DISCUSSION

The estimates of the mean were generally accurate, when both the point estimates and standard errors of estimation are considered. However, a rule of thumb cannot be offered on the basis of the data as no single sampling plan can lead to an accurate estimate for each situation of interest. In general, most of the plans led to accurate estimates of the mean when the percentage of the data base was increased. Most sampling plans utilizing more than approximately 1,400 observations lead to accurate estimates of the mean. When the results were viewed as a function of variations in t , k , n , or content area subtest, no trends were evident.

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TABLE 1
AVERAGE MEANS, VARIANCES, AND THEIR ASSOCIATED STANDARD
ERRORS OF ESTIMATION BY TOTAL NUMBER OF OBSERVATIONS, NUMBER
OF SUBTESTS, NUMBER OF EXAMINEES RESPONDING TO A SUBTEST, AND
NUMBER OF ITEMS PER SUBTEST, ACROSS ALL ITBS SUBTESTS AND
GRADES

Variable	\bar{X}	$SE(\bar{X})$	O^2	$SE(O^2)$
Total Number of Observations				
1400-2000	64.03	2.89	220.88	70.76
1000-1399	62.20	3.31	222.93	72.83
0-999	62.41	3.91	226.57	100.56
Number of Subtests				
2	62.68	3.54	245.58	88.52
3	62.10	3.29	222.53	77.18
4	63.47	3.17	213.49	79.42
5	62.21	3.57	211.55	83.83
Number of Items				
80	63.30	3.33	214.03	79.77
60	62.85	3.27	231.78	78.50
40	61.84	3.30	411.06	93.53
Number of Examinees				
10	63.61	2.91	216.88	88.69
5	61.03	3.67	214.13	80.94

TABLE 2
AVERAGE MEANS, VARIANCES, AND THEIR ASSOCIATED STANDARD
ERRORS OF ESTIMATION FOR VARYING TOTAL NUMBERS OF OBSERVA-
TIONS AND PERCENTAGE OF AVAILABLE DATA BASE BY SUBTESTS
ACROSS ALL GRADES

READING					
Observations	Per cent	\bar{X}	$SE(\bar{X})$	O^2	$SE(O^2)$
1400-2000	31-45	81.20	3.99	411.94	130.22
1000-1399	22-31	78.15	4.03	432.63	137.07
700-999	16-22	79.78	5.21	415.31	223.93

VOCABULARY					
Observations	Per cent	\bar{X}	$SE(\bar{X})$	O^a	$SE(O^a)$
1400—2000	49—70	57.77	1.93	83.44	28.79
1000—1399	35—49	58.29	2.78	83.17	33.20
700—999	25—35	57.60	3.12	82.97	38.28
A—1					
Observations	Per cent	\bar{X}	$SE(\bar{X})$	O^a	$SE(O^a)$
1400—2000	41—59	62.14	2.99	197.78	62.68
1000—1399	29—41	62.04	3.24	174.85	60.56
700—999	21—29	60.87	3.92	193.07	82.51
A—2					
Observations	Per cent	\bar{X}	$SE(\bar{X})$	O^a	$SE(O^a)$
1400—2000	58—83	47.88	2.25	136.17	43.76
1000—1399	42—58	46.59	3.00	147.18	45.10
700—999	29—42	46.06	2.98	155.30	64.48

TABLE 3
RESULTS FROM SCHOOL ONE, GRADE 5 (N=28) ARITHMETIC CONCEPTS
SUBTEST (K=136), WITH SPECIFIED INPUTS OF: $\mu=69.89$; $\sigma^2=184.04$; σ^a
(P)=.078. THE STANDARD ERRORS OF THE MEAN AND VARIANCE WERE
2.56 AND 50.09, RESPECTIVELY

Samp. Plan (t k n)	Obser. (tkn)	%	\bar{X}	$SE(\bar{X})$	σ^a	$SE(\sigma^a)$
2/68/10	1360	33	68.64	2.04	134.83	83.92
2/34/10	680	17	65.49	3.89	90.52	106.78
2/14/10	280	7	73.58	4.12	117.94	153.60
2/68/5	680	17	67.19	4.06	243.97	43.09
2/34/5	340	8	70.79	3.46	203.78	17.68
2/14/5	140	3	66.21	4.37	230.83	96.25
3/68/7	1428	35	70.68	2.95	215.76	34.74
3/34/7	714	18	67.37	4.28	199.97	29.97
3/14/7	294	7	66.95	8.50	182.03	71.37
3/68/4	816	20	70.14	2.47	283.01	66.62
3/34/4	408	10	66.99	3.61	178.01	48.22
3/14/4	168	4	60.48	4.23	197.97	82.84
4/68/5	1360	33	67.88	1.73	135.87	22.58
4/34/5	680	17	68.49	3.90	136.98	28.73
4/14/5	280	7	73.01	2.67	269.31	83.22
4/68/3	816	20	68.40	2.64	121.33	21.84
4/34/3	408	10	69.11	4.82	143.96	53.83
4/14/3	168	4	72.01	5.22	257.97	86.43
5/68/4	1360	33	70.61	2.42	148.37	36.13
5/34/4	680	17	67.34	1.17	211.59	58.72
5/14/4	280	7	71.19	4.56	210.44	52.69
5/68/2	680	17	70.36	2.12	190.52	54.09
5/34/2	340	8	67.09	3.29	140.40	47.69
5/14/2	140	3	74.55	4.99	288.32	107.77

ESTIMATION OF SMALL DATA-BASE GROUP PARAMETERS

The estimates of the variance were variable and inconsistent. In fact, the results were so inconsistent that comparisons are virtually uninterpretable across situations. The only observable trend was that as the total number of observations increased, the standard errors of estimation decreased, as one would certainly expect. When the results in estimating variance were viewed as a function of variations in t , k , n , or content area subtest, no trends were evident.

It should be noted that the sampling plan (s) within a particular grade level and content area subtest that lead content area subtest that lead to accurate estimates of one parameter (x or σ^2) did not necessarily lead to accurate estimates of the other.

A number of investigations by Shoemaker are directly relevant to this investigation. Shoemaker (1970a) systematically manipulated values of t , k , and n and reported that as the number of observations increased beyond 1.23 per cent of the data base, all the sampling plans produced essentially equivalent results. However, Shoemaker's data base was considerably larger than those considered in this study. In terms of the total number of observations, Shoemaker's 1.23 percentage of his available data is approximately 1,500 observations. (Shoemaker later omitted the 1.23 per cent although holding the 1,500 observations.) This figure roughly approximates the total number of observations at which the standard errors of estimate stabilized in this investigation. Thus, the results confirm the general finding of Shoemaker that the total number of observations is the most important variable with respect to the estimation of the mean, and provides some evidence that estimates of the mean obtained from the matrix sampling procedure tend to be rather consistent when the total number of observations exceeds approximately 1,400.

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Pattern of School Achievement in Primary Grades

A Critical Review of the Development Norms of Children

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The NCERT had carried out a large-scale research project in developmental psychology in collaboration with a number of university departments of psychology and education in order to have a wide regional coverage. This study was entitled 'Developmental norms project for children of 2½ years to 5 years of age'. Encouraged by the experience of conducting such a collaborative study, the NCERT decided to extend it to cover school-going children between 5½ to 11 years of age, studying in classes I to V.

THE FOLLOWING seven centres collaborated in the present study which was entitled Development Norms Project on children of 5½ to 11 years (abbreviated to DNP for convenience):

1. NCERT, Delhi.
2. Department of Applied Psychology, Bombay University.
3. Department of Psychology, Kerala University, Trivandrum.
4. Post-graduate Department of Education, Bangalore University.
5. Department of Psychology, Osmania University, Hyderabad.
6. Post-graduate Department of Psychology, Ranchi University.
7. Department of Psychology and Education, Gandhian Institute of Studies, Varanasi.

The major thrust of the present study was towards elucidating the nature and extent of relationships between certain independent variables which pertain to the school and home, and the dependent variables of school achievement and cognitive development of children of primary grades.

While allowing a certain amount of flexibility in the conduct of the studies by the seven collaborating centres, continuity and comparability of theme and research design among the separate studies was ensured by

(i) having a set of core of variables—-independent and dependent—common to all centres, and

(ii) granting freedom to different centres to include additional variables of their choice for study. Naturally, the Delhi centre carried out the coordination among the collaborating centres. There was free flow of communication between the collaborating centres, and tools developed by one centre were available for adoption by other centres. The overall design of the study was the same for all centres. Further, the tests of achievement in language and mathematics, developed by the Delhi centre, were adopted for use, with suitable modifications, translations, and adaptations by all the collaborating centres. A critical review of the study conducted by the Varanasi centre follows.

METHOD

Design

The universe for this study consisted of school-going children of the entire Varanasi district who belonged to the age range of $5\frac{1}{2}$ to 11 years, and were studying in Grade I, Grade II and Grade V. The age ranges for children sampled from the three grades were as follows:-

Grade I— $5\frac{1}{2}$ to $6\frac{1}{2}$ years

Grade II— $6\frac{1}{2}$ to $7\frac{1}{2}$ years

Grade V— $9\frac{1}{2}$ to 11 years

The sample children's current level of functioning along the following psychological dimensions was measured with the help of standardized tools or tools especially fabricated by the various centres:

(i) Intelligence

(ii) Social Maturity

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- (iii) Social acceptance
- (iv) Moral development

Information on the home, family and parental background conditions, and about the educational standards of the schools from which children were sampled was also collected. Tests for measuring Hindi and mathematics, and the Indian adaptation of the Lowenfeld Mosaic test, which tests the capacity of imaginative organization, were administered to all sample children.

The information so collected could be considered to belong to three conceptual categories:

- (i) Independent Variables : those including parental characteristics, home background factors, the standard and quality of schools attended, location of schools, age-grade and sex of subjects.
- (ii) Intervening variables : include social maturity, moral development, intelligence and social acceptability.
- (iii) Dependent variables : include achievement in Hindi and in mathematics and performance in the Mosaic Test.

The above data lend themselves to statistical analysis for studying the inter-relationship among all variables, as well as the nature and extent of the functional dependence of performance included under the category of dependent variables upon specific and varying combinations of scores classed under 'independent variables' and 'intervening variables'.

Sample

Multistage sampling was resorted to for obtaining representative samples of schools from urban and rural areas of the district of Varanasi, and then selecting students of appropriate age-grade combinations from the sampled schools.

Selection of Schools—Urban

A complete list of all primary schools within the Corporation area of

Varanasi city was prepared. From this list 15 schools were selected by following the stratified random sampling method, in which the following scheme of categorization was observed:

- (i) Size of the school — Large—Enrolment exceeds 400
Medium—Enrolment between 200-399
Small—Enrolment below 200
- (ii) Management Government
Aided
Private
- (iii) Composition Boys and Co-educational
Girls

Selection of Schools—Rural

Here the entire district was divided into four revenue subdivisions (tehsils) and from each tehsil about four to five schools were chosen randomly. A total of 16 rural schools were thus chosen.

The distribution of the sample schools in terms of several administrative variables has been shown in Table 1.

TABLE 1
DISTRIBUTION OF SAMPLE SCHOOLS ACCORDING TO
CERTAIN SCHOOL ADMINISTRATION VARIABLES

School Administration Variable	Symbol	Number of Schools		Total
		Urban	Rural	
1. <i>School Management</i>				
(a) Govt. and Local Bodies	A ₁	11	15	26
(b) Private, aided	A ₂	1	0	1
(c) Private, unaided	A ₃	3	1	4
2. <i>Sex Composition of Pupils</i>				
(a) Boys' school	B ₁	2	0	2
(b) Girls' school	B ₂	4	3	7
(c) Co-educational	B ₃	9	13	22
3. <i>School Size</i>				
(a) Large	C ₁	5	2	7
(b) Medium	C ₂	5	4	9
(c) Small	C ₃	5	10	15
4. <i>Medium of Instruction</i>				
(a) Hindi	D ₁	14	16	30
(b) English	D ₂	1	0	1

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5. <i>Shift System</i>	E ₁	11	16	27
(a) Single	E ₂	4	0	4
(b) Double				

By the combination of the separate categories from each of the five school administration variables, distinctive 'types' of schools can be identified, to one or other of which each school must belong. It was found that the sample of 31 schools belonged to 13 different 'types' :

- Type I. Govt./local body—girls—medium-size—Hindi medium — single shift : one urban school.
- Type II. Same as above but for boys : one urban school
- Type III. Same as Type I, but large in size : one rural school
- Type IV. Same as Type I, but double shift : one urban school
- Type V. Same as Type I, but small in size : two rural schools
- Type VI. Same as type V, but double shift : two urban schools.
- Type VII. Govt./local body—co-educational—large in size—Hindi medium single shift : two urban schools, and one rural school.
- Type VIII. Same as Type VII, but medium-size: two urban schools, and one rural school.
- Type IX. Same as Type VII, but small in size: two urban schools, and eight rural schools.
- Type X. Private aided—boys—large in size—Hindi medium—double shift: one urban school.
- Type XI. Private aided—co-educational—large in size—Hindi medium single shift: one urban school.
- Type XII. Same as Type XI, but English medium : one urban school.
- Type XIII. Same as Type XI, but medium-size: one urban school.

A few points of interest in the 'typology' of the school sample are :

- (i) The majority of rural schools, 10 out of 16, belong to a single type: local body managed, co-educational, small-sized, Hindi medium, single shift.
- (ii) The next most common type is similar to the above, save that the size of such schools is medium. These two types account for 15 out of the 31 schools included in the sample.
- (iii) More 'types' of schools are found in urban areas than in rural areas. Thus, 15 urban schools have been distributed among 11 disparate types, but 16 rural schools have been distributed among only five disparate types.

Selection of Subjects

In the selected schools, with the help of the class registers of Grades I, II and V, three lists of pupils were prepared along with their respective enrolment numbers. Next, the school register was consulted to select only those students whose ages fell within the range specified for a particular grade, i.e. $5\frac{1}{2}$ to $6\frac{1}{2}$ years for Grade I, $6\frac{1}{2}$ to $7\frac{1}{2}$ years for Grade II, and $9\frac{1}{2}$ to 11 years for Grade V. From these lists, about seven to nine students were picked randomly from each grade. In this way, the first sample consisted of a total of 680 pupils chosen from 31 schools. Since the testing had to be done in several phases, attenuation of the sample took place, reducing the final sample size to 301 subjects from 15 urban schools and 302 subjects from 16 rural schools.

Instruments Used

The variety of tools and instruments used in the present study is best appreciated when cast in terms of the three-fold classification of variables. This has been shown in Table 2.

Brief descriptions of these instruments, that were specially developed for the present study follow :

1. The School Variables Schedule

This is a composite schedule, with the help of which information about the management type of the school, its sex composition, its size, its shift system, and the medium of instruction used, was collected. It also contained three separate scales, one for teacher qualification, one for teacher-pupil ratio, and one for equipment and facilities, with the help of which the school could be categorized as either poor, average or good. By giving scores of 1, 2 and 3, for poor, average, and good, for each of the three sub-scale categories, a composite score, called Linear sum of School Equipment Category score (LinSEC in abbreviated form) was found for each school. LinSEC score ranged from 3 to 9.

2. Personal and Family Background Schedule

With the help of this schedule, detailed and categorical information on the following aspects of the personal and family background of each subject was collected:

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- (i) Father's education
- (ii) Mother's education
- (iii) Father's occupation
- (iv) Mother's occupation
- (v) Income
- (vi) Religion
- (vii) Caste

TABLE 2
LIST OF TOOLS AND INSTRUMENTS USED

<i>Variable : Category and Content</i>	<i>Tool</i>
I. Independent Variable	
(a) <i>Intrinsic Biological Factors</i>	Determined from school record
Sex	
Age	Special socio-economic status schedule constructed for this study
(b) <i>Family Background Factors</i>	
Parents' Education	
" Occupation	
" Income	
" Religion	Complete School Facilities Scale (Constructed by the Bangalore Centre)
" Caste	
(c) <i>School Environmental Factors</i>	
Teacher Qualification	Schools sampled from rural and urban areas.
Teacher-Pupil Ratio	
School Equipment	
(d) <i>Ecological Factors</i>	
Locale of School	
II. Intervening Variables	
(a) Moral development	Moral Relativism Scale (constructed by the Hyderabad centre)
(b) Social acceptance	Sociometric test (developed by the Varanasi centre)
(c) Social Maturity	Social Maturity Scale (developed by the Bangalore centre)
(d) Intelligence	Porteus Maze Test
III. Dependent Variables	
(a) Language skills	Achievement Test for Hindi (developed by the Delhi centre)
(b) Mathematics	Achievement Test for Mathematics (developed by the Delhi centre)
(c) Perceptual Organising Ability	Indian Adaptation of the Lowenfeld Mosaic Test (developed by the Varanasi centre).

There were eight categories under 'father's education' and 'mother's education', ranging from 'illiterate' through all stages of education to 'post-graduate'. Likewise, there were nine separate categories under 'father's occupation' and 'mother's occupation', ranging from 'unemployed' through unskilled manual labour, clerical work, etc. to higher professional and technical jobs. There were altogether eight categories under 'income', ranging from 'below Rs. 100' to 'above Rs. 1500'. There were four categories for religion and caste considered together :

Scheduled Castes, Hindus
 Scheduled Tribes, Hindus
 Backward castes, Hindus, Muslims, Sikhs, and Christians
 Upper Castes, Hindus

By combining the rank-scores or weights for the different categories under each of the seven separate variables of personal and family background, a composite score called 'linear sum of socio-economic' status, scores (LinSES) was obtained for each subject. The LinSES score is equivalent to the usual SES scores used in social surveys. LinSES scores ranged from a minimum of 2 to a maximum of 42. A score of 2 represents a subject whose father and mother are illiterate, are both unemployed, have an income less than Rs. 100 per month, and belong to the Scheduled Caste. On the other hand, a LinSES score of 42 stands for a subject whose father and mother both have postgraduate degrees, an income exceeding Rs 1500 per month, have professional jobs, and belong to the upper castes.

3. *Scale for Social Maturity*

This scale comprised 65 items of the typical behaviours and actions of the school children, which covered the following areas :

- | | |
|---------------------|-----------------------------------|
| (i) Self-direction | (v) Self-confidence |
| (ii) Locomotion | (vi) Friendship |
| (iii) Communication | (vii) Ability to withstand stress |
| (iv) Cooperation | (viii) Leadership |

Each item was scored a +, ± or —, depending upon whether the behaviour occurred frequently, rarely, or never. The basal age for any subject was established by noting the age corresponding to that item of behaviour, upto which he had been marked + *continuously*. Additional items scored + and ± beyond the basal age item, were given difference scores, full for +, and

half for \pm . In this way a total social maturity age, was obtained for each subject. The assessment of each pupil was done by teachers who knew the subject well.

4. Scale for Moral Relativism

The Hindi version of this scale is called '*Nattik Vikas Parikshan*'. It consisted of three sub-scales :

- (i) Social reaction
- (ii) Moral problems
- (iii) Offence evaluation

Under each of the first two areas, viz. social reaction and moral problems, there were six items, with three alternative answers, one of which was (morally) correct. The total number of correct items checked by the subject was the score for these two sub-scales. The third sub-scale, on offence evaluation, consisted of 15 items, each in the form of pair comparison statements, between seven kinds of offences and five kinds of punishments, varying in severity. The subject indicated which of the offences was more serious and the appropriate punishment for it. The scores obtained from the three sub-scales were summed to yield an 'ethical discrimination' score. The scores ranged from 0 to 27.

5. Sociometric Test for Measuring Social Acceptance

This extremely short test had only one item, which required the subject to give the names of three of his best friends, in order of preference, from his own class or section. From the choices so given the numbers of the first, second and third choices obtained by each subject were found out. These were given weights of 3, 2 and 1 respectively, from which a weighted 'sociometric status index score, was calculated for each subject, which indicated how popular each subject was within his own peer group.

6. Porteus Maze Test for Measuring Intelligence

This well known and standard non-verbal test for measuring intelligence can be used with subjects who are three years and above of age. Corresponding to each age-group, there is a maze, which increases in complexity with age. In the present study, the testing began with the maze corresponding to age five.

A child was required to trace a path through the maze, from the starting point to the goal. The subjects were permitted to attempt the maze for the next higher age-group, so long as they could correctly trace the path. In case the child failed two additional trials were permitted. When he failed all the trials for one age-group, the maze he could trace at the third attempt established his 'basal age'. He was given the maze for the next age-group, and allowed three trials as before. This process continued until three failures each in two successive age-tests occurred, when testing was stopped. The mental age was calculated by adding credits for tests completed beyond the basal age. From the mental age, I.Q. was calculated.

The Porteus maze test is a simple, inexpensive, easily administered, culture-free test which does not involve verbal ability. It is also relatively free from influences of previous learning and experience. Above all, it takes very little time to administer.

7. Achievement Test for Hindi

For Grade I, there were three sub-tests :

- (a) Word recognition, with 30 items
- (b) Sentence comprehension, with 17 items
- (c) Sentence picture association, 12 sets of 4 pictures and 4 sentences.

Thus, total score for the three subjects together was $30+17+48=95$.

For Grade II, there were three sub-tests :

- (a) Sentence picture association—the same as used for Grade I, with a maximum score of 48.
- (b) Read and Do—18 items, each with three or four items, and three different tasks, maximum score 20.
- (c) Sentence completion—with 20 items, each with four alternative choice answers.

Thus the total score for the three sub-tests together was $48+20+20=88$.

For Grade V, there were three sub-tests as follows :

- (a) Synonyms Test—containing 40 items, each with four alternative choice answers, one of which was correct.
- (b) Antonyms Test—containing 30 items each with four alternative choices, one of which was correct.

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- (c) Reading comprehension—consisting of six sets of one or more paragraphs, each set being followed by four, five or six questions, based on the set of paragraphs. Four alternative answers were provided with each question, one of which was correct. The maximum score for this subtest was 30.

Thus the total score for the entire test was $40 + 30 + 30 = 100$.

8. *Achievement Test for Mathematics*

For Grade I, the test consisted of 40 items, dealing with numbers, quantities, and simple arithmetical operations, and one test of recognition of common geometric forms. Maximum possible score for this test was 40.

For Grade II, the test contained 30 items. There was one item which involved recognition of coins from pictures. The rest of the items involved simple arithmetical operations. Each question was provided with four alternative answers, one of which was correct. The maximum possible score for this test was 30.

For Grade V, the test had a few items on recognition of geometrical forms and definitions, on calendar time and reading of time by the clock. The remaining items involved arithmetical operations. The maximum score for this test was 30.

9. *Indian Adaptation of the Lowenfeld Mosaic Test*

This test consisted of ten plastic pieces in each of the possible combinations of six colours—blue, green, yellow, orange, red, and black, and six shapes—rectangle, square, rhombus, isosceles triangle, equilateral triangle and cross. Thus there were 360 pieces in all. The subject was required to make a design by arranging any number of the coloured plastic pieces of his choice on a tray. A permanent replica of the design was made. Objective features of the mosaic design, like time taken, total number of pieces used, number of sub-designs, and area covered by the design, were recorded. The qualitative features of each design were also rated by three expert judges with the help of a 15-item three-point rating scale. The average of the ratings given by the three judges was obtained for each design.

Procedure

Considerable time was spent on pilot testing with four schools—two urban and two rural, from which about 100 subjects were sampled. In the light of

the experience of the pilot tests, and periodic discussions among project directors of all the collaborating centres, the instruments and the procedure were finalized.

The testing programme was carried out in four stages:

1. First Round, August-October, 1972. All the 31 schools were visited and four tests administered: school facilities schedule, family background-SES schedule, Porteus maze test, mosaic test.

2. Second Round, December 1972-February, 1973. Thirteen urban, and ten rural school were visited, and three tests administered: social maturity test, sociometric test, moral relativism test.

3. Third Round, March-April 1973. Fourteen urban schools and all the 16 rural schools were visited for administering the two achievement tests in Hindi and mathematics respectively.

4. Fourth Round, mainly July-August, 1973. The fourth visit was made to catch 'stragglers' who, due to absence during the second and/or third round visits, missed one or more tests. In this way test results for 35 stragglers were obtained.

Data Treatment and Analysis

First master sheets were prepared in which all data, whether qualitative or quantitative, were recorded. These were converted into the numerical scores through appropriate transformation wherever required with the help of the code book, which had been developed in consultation with the Delhi centre. The coded book contained complete coding procedures for all variables, which numbered 41, including two derived variables, viz. LinSEC (for school facilities) and LinSES (for SES). There were 23 independent variables, five intervening variables, and 13 dependent variables. IBM cards were punched from the coded scores.

The data punched in cards were statistically analyzed by the Computer Centre of the Planning Commission, New Delhi. Data analysis was done in five major sections:

- (i) Descriptive statistics of three sets of variables
- (ii) Correlation between appropriate pairs of variables within the same group
- (iii) Relationship between independent and intervening variables
- (iv) Significances of differences between group means of selected variables
- (v) Multivariate prediction of performances (dependent) variables

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The more important and interesting results of the data analysis follow.

MAJOR FINDINGS

Quality of the School Sample

By adding the rank-scores obtained from the three objective scales measuring the quality or excellence of the academic level of the school, a composite score, called LinSEC, was obtained for all the sample schools. The distribution of the 31 schools of the sample according to LinSEC scores is shown in Table 3.

TABLE 3
DISTRIBUTION OF SCHOOL EXCELLENCE CATEGORY
SCORES (LINSEC) AMONG SAMPLE SCHOOLS

LinSEC Score	Urban School		Rural Schools		All Schools		Pupils	
	Frequ- ency	Per cent	Frequ- ency	Per cent	Frequ- ency	Per cent	Frequ- ency	Per cent
3	0	0.00	2	12.50	2	6.45	38	6.3
4	1	6.67	4	25.00	5	16.13	87	14.4
5	5	33.33	7	43.75	12	38.71	212	35.2
6	3	20.00	2	12.50	5	16.13	118	19.6
7	3	20.00	1	6.25	4	12.90	78	12.9
8	2	13.39	0	0.00	2	6.45	51	8.5
9	1	6.67	0	0.00	1	3.23	19	3.1
Total	15	100.00	16	100.00	31	100.00	603	100.0

An examination of Table 3 will make it clear that the rural schools, on the whole, were poor in terms of the academic-instructional level than the urban schools. If a LinSEC score of 6 is taken as the average value for the scale, then we find that among the 16 rural schools, there are only three which are average or above. But among the 15 urban schools, three are average, and six above average. There is no really poor school in the urban sample (LinSEC of 3), but there are two such schools in the rural sample. Likewise, while there are six schools below average (LinSEC of 4 and 5) among urban schools, there are 11 such schools among the rural schools. Thus it is clear that the two school samples are not equivalent in terms of the level of academic excellence, the urban schools having a distinctly higher level than most rural schools.

Figure 1 (p. 42) shows the extent of non-overlap between the two sets of schools, urban and rural, in terms of the level of academic quality.

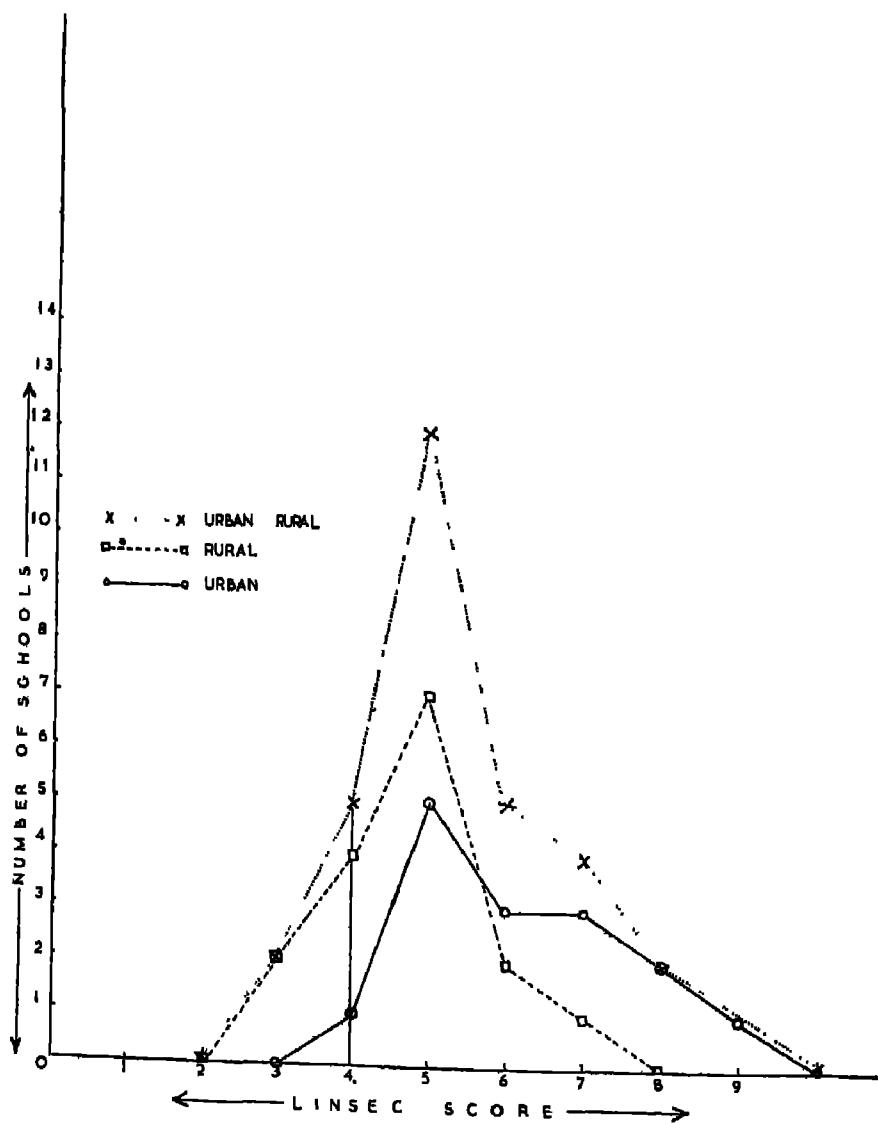


Fig. 1. Overlap between urban and rural schools in terms of LinSEC (level of academic excellence) scores.

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The pedagogic implication of this difference has to be appreciated. Since the respective sizes of the rural and urban school samples were comparable (15 and 16 respectively), the percentages of pupils subjected to different levels of excellence of schooling roughly correspond to the respective percentages of schools under each category of LinSEC scores, ranging from 3 to 9. However, the exact number of pupils in the sample, undergoing instruction in schools varying in terms of LinSEC scores, has been shown in the last two columns of Table 3. These two columns convey information of considerable pedagogic interest. There were 38 pupils in two really poor schools, both in rural areas. Secondly, no less 56 per cent of the sample were attending schools below the average standard. Another 20 per cent were in average schools. That leaves about 24 per cent who were in 'above average' schools. Among these 148 'advantaged' students, 70 were in two really good schools, both in urban areas. The conclusion is clear—in terms of level of schooling, there was a pronounced bias in favour of the urban sample, as compared to the rural one. This is a built-in differentiation which would exercise its impact on children's academic achievement pattern.

We may summarize the rural-urban dichotomy of schools thus: there were seven 'below average' schools (one urban, six rural), compared to 21 'average schools' (11 urban, 10 rural) and three 'above average' schools (all urban).

Characteristics of the Respondent Sample of School Children

The number of boys and girls sampled from the three grades, from each of the 15 urban and 16 rural schools, have been shown in table 4.

TABLE 4
NUMBER OF BOYS AND GIRLS SAMPLED FROM THREE GRADES
FROM THE URBAN AND RURAL SCHOOLS

Location	Grade I			Grade II			Grade V			All Grades		
	Male	Fem-	Total	Male	Fem-	Total	Male	Fem-	Total	Male	Fem-	Total
Urban	66	42	108	57	39	96	65	32	97	188	119	301
Rural	61	35	96	66	26	92	83	31	114	210	92	302
Total	127	77	204	123	65	188	148	63	211	398	205	603

It will be seen that the proportion of subjects between rural and urban schools, from grade to grade, for both sexes, does not show any wide fluctuations.

Family Background: The education level of both the mother and father of

workers' category. There were very few women who had well-paid professional jobs. However, more parents in the urban sample had jobs in the upper categories, compared to their rural counterparts. Indeed, in the rural sample, there were no parents who had occupations in the highest categories, compared to 13 among urban parents.

Income of Families : The monthly income of the family of the subject taken as a unit was carefully ascertained. Income level was categorized into eight classes, and the distribution of the families into these eight income categories has been shown in Table 7.

The point worth noting in the two distributions of income levels is that, upto the income slab of Rs.500-700 per month, the number of families in the urban group is 248 in the rural group. But in income slabs above this level, there are 53 urban families, as compared to 24 rural families. Thus a sharp break occurs at the Rs. 500-700 level: upto this level, there are more rural families than urban families.

Religion and Caste : There were 254 Hindus, 40 Muslims, four Christians and three Jains in the urban sample; in the rural sample, there were 28 Hindus, 12 Muslims and one Sikh. Again, in the urban sample, 22 belonged to the scheduled castes, 139 belonged to backward castes, 96 belonged to upper castes, 40 were Muslims, and four Christians. In the rural sample there were 26 from the scheduled castes, 152 from backward castes, 111 from upper castes, 12 Muslims and one Sikh.

Composite Socio-Economic Status : By summing the rank scores of fathers' education, mothers' education, fathers' occupation, mothers' occupation, income and religion-caste, a composite socio-economic status score, called LinSES, was obtained for each subject. The distribution of LinSES scores of subjects from different types of schools has been shown in Table 8.

TABLE 8
DISTRIBUTION OF LINESSES AMONG SAMPLES DRAWN
FROM DIFFERENT TYPES OF SCHOOLS

LinSES score Interval	Urban Area				Rural Area Aided (n=16)		All Schools (n=31)	
	Private		Remaining		N	Per cent	N	Per cent
	Unaided		Aided					
	(n=3)	(n=12)						
	N	Per cent	N	Per cent				
2-10	0	0.0	101	43.7	102	33.8	203	33.7
11-19	17	24.3	112	48.5	186	61.6	315	52.2
20-28	39	55.7	18	7.8	14	4.6	71	11.7
29-37	12	17.1	0	0.0	0	0.0	12	2.0
38-42	2	2.1	0	0.0	0	0.0	2	0.3

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A close examination of Table 8 will reveal that, in terms of the socio-economic status, the 'private unaided' schools from the urban areas belong to a distinctly different and higher category than the 'aided' schools. The proportion of sample children belonging to socio-economic status with LinSES scores 20 and above in the 'private unaided' schools is 74.9% compared to 7.8% in 'aided' schools in urban areas, and 4.6% in rural areas. In fact, in these types of schools, there was none with LinSES scores above 29. In the urban 'aided' schools, 92.2% had LinSES scores ranging from 2 to 19; the same in rural 'private' schools was 95.4%. Thus, it is clear that an overwhelmingly large proportion of the entire sample—about 90 per cent—belonged to the poor, disadvantaged section (LinSES score ranging from 2 to 19); another 12 per cent belonged to the lower middle group (LinSES score ranging from 20-28); less than 2.5 per cent belonged to the advantaged group, who were all studying in 'private aided' schools in urban areas. We may conclude this section by pointing out that, in the affluent private schools, there were only 17 subjects who belonged to the lower SES level, and none in the lowest SES level.

We may mention here that computation of the coefficients of contingency, C, between the seven components of the background variables showed them to be generally highly correlated among themselves, religion and caste correlating highest. We may also note that the value of the contingency coefficient, C, between the family background components and the three categorical school variables, viz. management type, sex composition, and shift system, was moderate. Further, the correlation between LinSES scores, and LinSEC scores (indexing level of school excellence) was uniformly of moderate to high value, in all groups of respondents, homogenous with respect to sex, location or grade or when one or more of these factors combined to obtain larger and more heterogenous groups.

We can now take up systematic consideration of the findings from the administration of the various tests, topping, intervening and dependent variables.

FINDINGS

I. Performance in Intervening Variables

For describing the patterns of scores in different tests, a uniform scheme is necessary, which will permit comparison across different groups of children, varying from one or more independent variables. For the sake of simplicity, the most elementary or core group has been envisaged as one belonging to the same age-grade, (I, II or V), sex (male or female), and location (urban or rural). In this way, we get altogether 12 core groups, homogenous with

respect to age-groups, sex and location, which give rise to other bigger, and more heterogeneous groups, by collapsing one, two or three independent or control variables. The following scheme will make the increasing heterogeneity of larger groups clear :

I. Most homogenous groups homogenous with respect to sex, location and age-grade :

Grade I	Urban, Male	Rural, Male
	Urban, Female	Rural, Female
Grade II	Urban, Male	Rural, Male
	Urban, Female	Rural, Female
Grade V	Urban, Male	Rural, Male
	Urban, Female	Rural, Female

II. Groups homogenous with respect to age-grade and sex, but heterogeneous with respect to location :

Grade I	Urban+Rural, Male	Urban+Rural, Female
Grade II	Urban+Rural, Male	Urban+Rural, Female
Grade V	Urban+Rural, Male	Urban+Rural, Female

III. Groups homogenous with respect to age-grade and location, but heterogeneous with respect to sex :

Grade I	Urban, Male+Female	Rural, Male+Female
Grade II	Urban, Male+Female	Rural, Male+Female
Grade V	Urban, Male+Female	Rural, Male+Female

IV. Groups homogenous with respect to age-grade only, but heterogeneous with respect to both sex and location:

Grade I	Urban+Rural,	Male+Female
Grade II	Urban+Rural,	Male+Female
Grade V	Urban+Rural,	Male+Female

We thus see that group statistics for no less than 27 groups are possible and meaningful. In practice, some more groups can be formed, by keeping them homogenous with respect to sex, and/or location, but collapsing along the age-grade trichotomy. But, since we are interested in the developmental aspects of psychological and educational functioning such collapsing along the age-grade variable may not be very meaningful, save on certain restricted occasions.

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There were four intervening variables:

- (i) Intelligence
- (ii) Social maturity
- (iii) Moral-ethical development
- (iv) Social acceptance.

Let us look into the test results for each variable, in that order.

Intelligence : Both mental age and IQ were obtained from the Porteus Maze test performance score. It was found that in all possible groups, the correlation between IQ and Mental Age was very high—in fact it was never less than 700, but usually above 950; therefore only results for IQ will be reported. The mean IQ values for different types of groups varying in size and homogeneity have been shown in Table 9.

TABLE 9
MEAN VALUES OF IQ FOR DIFFERENT GROUPS VARYING
IN TERMS OF HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban + Rural	
		N	Mean	N	Mean	N	Mean
I.	Male	66	62.26	61	99.00	127	95.50
	Female	42	84.12	35	86.86	77	85.82
	M + F	108	89.09	96	94.94	204	91.84
II.	Male	57	92.95	66	98.77	123	96.07
	Female	39	88.82	26	92.92	65	90.62
	M + F	96	91.27	92	97.12	188	94.13
V.	Male	65	107.42	83	106.86	148	107.10
	Female	32	97.59	31	92.55	63	95.11
	M + F	97	104.18	114	102.96	211	103.52
All grade	Male	188	97.17	210	102.03	398	99.99
	Female	113	89.53	92	90.87	205	90.13
	M + F	30	94.63	302	98.63	603	96.62

Several points are worth noting in the various group means shown in Table 9. First, the female subjects have uniformly lower IQs than their male counterparts in all group comparisons. Secondly, the mean IQ values systematically increase as we go from Grade I through II to Grade V. Thirdly, there is an interesting rural-urban reversal. In Grades I and II, rural children, male as well as female, have higher mean IQs than their urban counterparts. But in Grade V, there is a reversal—the mean IQs of urban children, both male and female, are higher than those of rural children.

At this stage, it may also be pointed out that an analysis of variance shows that the main effect, due to location of schools, is not significant for any of the pairs of group means for the 12 most homogenous groups. We may conclude that the differences between mean IQ values between urban and rural school groups is attributable to sampling fluctuations.

Social Maturity : Just like IQ means, the means of social maturity scores for different groups have been shown in Table 10.

It is noteworthy that the minimum social maturity score for any group is 10.11 (Grade I, urban female), and the maximum is 12.08 (Grade V, rural male). All other mean values fall within this range, which is admittedly very narrow. However, the slight but consistently higher mean social maturity score for rural groups (higher than the urban groups) is also to be noted. Out of six comparisons, in only one case (Grade V, female), is the rural group mean lower than the urban group means. Likewise, in 10 out of 12 comparisons, the mean for female groups is lower than that for male groups, even though the difference is only slight. Analysis of variance results also confirm that the main effect of location is not significant for social maturity group means.

TABLE 10
MEAN VALUES OF SOCIAL MATURITY SCORES FOR DIFFERENT
GROUPS VARYING IN TERMS OF HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban+Rural	
		N	Mean	N	Mean	N	Mean
I.	Male	66	11.28	61	11.88	127	11.69
	Female	42	10.11	35	11.17	77	10.59
	M+F	108	10.82	96	11.62	204	11.19
II.	Male	57	10.93	66	11.74	123	11.37
	Female	39	10.69	26	12.06	65	11.29
	M+F	96	10.83	92	11.83	188	11.32
V.	Male	65	11.33	83	12.08	148	11.75
	Female	32	11.95	31	10.86	63	11.41
	M+F	97	11.54	114	11.75	211	11.65
All grades	Male	188	11.19	210	11.91	398	11.57
	Female	113	10.84	92	11.32	205	11.05
	M+F	301	11.05	302	11.72	603	11.39

Moral-Ethical Development : The mean scores obtained in the 'moral relativism' scale by different groups have been shown in table 11. We may recall that the theoretically maximum score obtainable in this scale is 27.

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Reference to Table 11 will show that the lowest mean for any group is 10.30. (Grade I, rural, males), and the highest is 15.42 (Grade V, urban males).

The differences between groups in terms of homogeneity of sex seem to be due to sampling fluctuations: in three comparisons the female group means are higher than rural group means, and in the remaining three the trend is reversed. However, the urban groups appear to have scored slightly but consistently higher than the rural groups. There is also a slight but systematic trend of increase in the mean value from Grade I through Grade II to Grade V. This is to be expected on the logic of developmental psychology. In any case, the moral relativism scale is somewhat better in discriminating between age-groups than the social maturity scale.

TABLE 11
MEAN VALUES OF MORAL RELATIVISM SCALE SCORES FOR DIFFERENT
GROUPS VARYING IN HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban + Rural	
		N	Mean	N	Mean	N	Mean
I	Male	66	12.44	61	10.30	127	11.41
	Female	42	11.79	35	10.91	77	11.39
	M+F	108	12.19	90	10.52	204	11.40
II	Male	57	11.47	66	11.80	123	11.65
	Female	39	13.38	26	12.96	65	13.22
	M+F	96	12.25	92	12.13	188	12.19
V	Male	65	15.42	83	14.53	148	14.92
	Female	32	14.63	31	13.39	63	14.02
	M+F	97	15.15	114	14.22	211	14.74
All grade	Male	188	13.17	210	12.44	398	12.79
	Female	113	13.14	92	12.33	205	12.77
	M+F	301	13.16	302	12.41	603	12.78

Social Acceptance. The sociometric status index was calculated from each subject on the basis of nominations received from classmates of his or her class or section. The mean values of the 'sociometric status' index for different groups have been shown in Table 12.

TABLE 12
MEAN VALUES OF SOCIOMETRIC STATUS INDEX FOR DIFFERENT
GROUPS VARYING IN HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban+Rural	
		N	Mean	N	Mean	N	Mean
I	Male	66	2.70	61	2.34	127	2.54
	Female	42	2.77	35	1.89	77	2.37
	M+F	108	2.73	96	2.18	204	2.47
II	Male	57	2.35	66	2.62	123	2.49
	Female	39	2.86	26	3.73	65	3.21
	M+F	96	2.56	92	2.93	188	2.74
V	Male	65	4.82	83	4.18	148	4.46
	Female	32	4.00	31	3.80	63	3.89
	M+F	97	4.55	114	4.07	211	4.29
All grade	Male	188	3.86	210	3.15	398	3.24
	Female	113	3.15	92	3.05	205	3.11
	M+F	301	3.26	302	3.12	603	3.19

The substantial increase in average sociometric status index values from Grade I and Grade II to Grade V may be noted. But this trend is more consistent with rural groups. Further, the girls on the whole have tended to have lower averages than boys, though there are exceptions in Grade II. However, on the whole, the average value of the sociometric status index has been low, showing the absence of many stars in the sample.

Correlation between Independent and Intervening Variables

At this stage we may like to consider the nature of the correlation between the variables studied so far, viz. the independent variables and the intervening variables. For the independent variables, two composite measures, the LinSES and LinSEC, lend themselves admirably for this type of statistical analysis; both are composite scores subsuming a number of separate variables, and both yield objective and numerical scores in interval scales. Of course, the scores in the four intervening variables are all in interval scales. The product-moment coefficients of correlation among these variables, for groups varying in homogeneity and size, have been shown in Table 13.

It may be noted that the correlation between LinSES and LinSEC is moderately high, ranging from .513 to .406. This is expected on logical grounds—children from the more advantaged section of the community

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attend the better types of schools. Next, we note that LinSES correlates .242 with IQ in Grade I, and .173 in Grade V, but this correlation is only .001 in Grade II. Likewise LinSEC correlates .242 with IQ in Grade I, and .076 in Grade V, but only .019 in Grade II.

Another interesting point is that 'moral relativism' has uniformly good correlates with both LinSES and LinSEC in all the three age-grade groups.

However, the most interesting point worthy of note is that, the correlation of IQ with the remaining variables, which are uniformly moderately valued in Grade I, tend to dwindle considerably in Grade II, as well as in Grade V. The correlations among the four intervening variables are either moderate or small in Grade I, but tend to dwindle somewhat in both Grades II and V, so much so that in Grade V, two of the correlations become negative in sign.

This finishes our discussion of the findings with regard to intervening variables for the present.

Performance in Achievement Tests

Within the third category of variables, viz. dependent variables, there were three, viz. achievement test in Hindi, achievement test in mathematics, and performance in mosaic test.

Achievement in Hindi: The Hindi achievement test in each of the three Grades consisted of three subtests. Now, it was found that these three tests correlated quite appreciably among each other, and of course each subtest correlated very well with the total score, in which the subtest score was included, as shown in Table 14.

The correlations between the subtests being so high, there is justification for using the total score, which is the composite of all the three test scores, for subsequent discussions. The performance of the students in all the three Grades has been summarized in Table 15, where the mean scores in the achievement test in Hindi for groups varying in homogeneity and size have been shown.

It is quite clear that in achievement in Hindi, certain differentials exist between rural and urban schools, and between male and female pupils, which is not consistent across the three Grades. In Grade I, the girls performed consistently better than boys, both in urban and rural schools. In Grade II, girls in urban schools did much better than boys, but in rural schools, they performed equally well. In Grade V, however, the girls fell behind the boys, both in urban and rural schools.

But the picture is somewhat different when rural-urban variations are considered. In each of the three Grades, for both boys and girls, the urban

TABLE 13

PRODUCT-MOMENT COEFFICIENTS OF CORRELATION AMONG TWO
COMPOSITE INDEPENDENT VARIABLES, AND FOUR
INTERVENING VARIABLES IN THREE GRADES

<i>Variable</i>	<i>Variable</i>					
	<i>LinSES</i>	<i>LinSEC</i>	<i>IQ</i>	<i>Soc. Mat.</i>	<i>Moral Rel.</i>	<i>Soc. Stat. I</i>
Grade I N=204 Urban+Rural, Male+Female						
1. LinSES	.	513	242	090	328	155
2. LinSEC		.	192	055	347	202
3. IQ			.	220	202	104
4. Soc. Mat.				.	069	-024
5. Moral. Rel.					.	092
6. Soc. Stat. Ind.						.
Grade II N=188 Urban+Rural, Male+Female						
1. LinSES	.	.414	-.001	028	228	021
2. LinSEC		.	019	-.333	178	013
3. IQ			.	080	011	034
4. Soc. Mat.				.	101	184
5. Moral Rel.					.	045
6. Soc. Stat. Ind.						.
Grade V N=211 Urban+Rural, Male+Female						
1. LinSES	.	.406	173	-.156	393	-.027
2. LinSEC		.	076	-.295	305	-.074
3. IQ			.	-.004	111	151
4. Soc. Mat.				.	-160	061
5. Moral Rel.						225
6. Soc. St. Ind.						.

N.B. Decimal points have been omitted.

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TABLE 14
INTER-CORRELATIONS AMONG THE THREE SUBTESTS OF THE
ACHIEVEMENT TEST IN HINDI, FOR ALL SUBJECTS OF THE
THREE GRADES.

Variable	Variable			
	Subtest 1	Subtest 2	Subtest 3	Entire test
Grade I. N=204. Male+Female. Urban+Rural				
Subtest 1		.782	.752	.898
Subtest 2			.884	.934
Subtest 3				.959
Entire test				
Grade II. N=188. Male+Female, Urban+Rural				
Subtest 1		.646	.613	.800
Subtest 2			.550	.959
Subtest 3				.703
Entire test				
Grade V. N=211. Male+Female, Urban+Rural				
Subtest 1		.764	.621	.914
Subtest 2			.635	.893
Subtest 3				.842
Entire test				

TABLE 15
MEAN VALUES OF ACHIEVEMENT TEST IN HINDI FOR DIFFERENT
GROUPS VARYING IN HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban+Rural	
		N	Mean	N	Mean	N	Mean
I	Male	66	29.94	61	28.38	127	29.15
	Female	42	43.64	35	29.77	77	37.34
	M+F	108	35.27	96	28.29	204	32.26
II	Male	57	34.14	66	32.71	123	33.37
	Female	39	47.79	26	32.54	65	41.69
	M+F	96	39.69	92	32.66	188	36.25
V	Male	65	42.72	83	37.92	148	40.43
	Female	32	37.38	31	29.29	63	33.40
	M+F	97	40.96	114	35.57	211	38.05

groups have done better than the rural groups. However, let it be noted that the magnitude of the differences between the averages of the urban and rural groups tend to increase from the lower to the upper grades, as shown below:

DIFFERENCE BETWEEN URBAN AND RURAL AVERAGE

<i>Grade</i>	<i>Male</i>	<i>Female</i>
I	1.56	13.87
II	1.43	15.25
V	4.80	8.09

The urban-rural difference in mean achievement in Hindi is not significant, for boys, in any of the three grades. The differences in mean achievement between urban and rural girls are relatively greater in magnitude, and one of them, in Grade II, reaches significance at .05 level. The conclusion that follows is that location of schools appears to be exerting some influence on the acquisition of language skills, that tend to accentuate the differences between urban and rural school children. This influence is acting in a complicated manner.

Let us summarize: If the performance of boys and girls is considered together, urban children are consistently better than their rural counterparts in all the three Grades. If rural and urban children of the same area are considered together, then in Grades I and II, the girls are better than boys, but in Grade V, the opposite is the case.

Performance in Mathematics Achievement Test : The mean scores in the achievement test in mathematics for different groups have been shown in Table 16.

The most important point to be noted is that in each Grade, the rural children, both males and females, have scored less than urban children. However, the magnitude of mean differences for boys of urban and rural schools is very small, save in Grade I. The difference is somewhat larger for girls from urban and rural groups. Secondly, it is again an interesting finding that in Grades I and II, in urban schools, girls have done better than boys. In the rural schools, in Grade I, boys have done better than girls, but in Grade V, girls have again done better than boys. In Grade V, however, the girls in urban as well as rural schools have done worse than boys.

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TABLE 16
MEAN VALUES IN MATHEMATICS ACHIEVEMENT TEST FOR DIFFERENT
GROUPS VARYING IN HOMOGENEITY AND SIZE

Grade	Sex	Urban		Rural		Urban + Rural	
		N	Mean	N	Mean	N	Mean
I	Male	66	16.70	61	14.03	127	15.42
	Female	42	19.40	35	12.66	77	16.34
	M + F	108	17.75	96	13.53	204	15.76
II	Male	57	9.49	66	9.42	123	9.45
	Female	39	11.28	26	10.15	65	10.83
	M + F	96	10.22	92	9.63	188	9.23
V	Male	65	9.85	83	9.07	148	9.41
	Female	32	8.75	31	6.74	63	7.78
	M + F	97	9.49	114	8.44	211	8.92

Performance in Mosaic Test : From the design constructed by the subject in the mosaic test, a number of measures were obtained, some of which were related to the objective features of the design, and the others to its subjective attributes. A huge mass of data was thus produced, space being insufficient to report all of them. However, the findings with regard to the subjective qualities of the mosaic designs constructed by the children will be reported here briefly.

Each mosaic design was rated by three sophisticated judges independently, with the help of a composite rating scale consisting of three sub-scales. Each item was in the form of a three-point graphic rating scale. Sub-scale I, also called the P-scale, consisted of six items dealing with the pattern qualities of the design. Sub-scale II, also called the A-scale, also consisted of six items dealing with the aesthetic qualities of the design. Sub-scale III, also called M-scale, consisted of three items dealing with miscellaneous qualities of the design.

The correlations between the scores in the three sub-scales were uniformly high in groups varying in size and homogeneity. The ratings from the three sub-scales, when added together, yielded a 'total rating score' (ranging from 15 to 45) which reflected the level of excellence of the design. The mean values of 'total rating score' in the mosaic test for different groups have been shown in Table 17.

It is clear that the mean value of the rating of the mosaic designs increases systematically from Grade I through II to Grade V, in all groups—urban and rural, male and female. The difference between the two sexes is only slight. Likewise, even though the rural groups have slightly lower averages than the urban groups, the differences are very small, and never statistically significant.

TABLE 17
MEAN VALUES OF 'TOTAL RATINGS' GIVEN TO THE MOSAIC DESIGNS
CONSTRUCTED BY DIFFERENT GROUPS VARYING IN HOMOGENEITY
AND SIZE.

Grade	Sex	Urban		Rural		Urban+Rural	
		N	Mean	N	Mean	N	Mean
I	Male	66	28.53	61	27.77	127	28.17
	Female	42	29.09	35	27.52	77	28.37
	M+F	108	28.75	96	27.68	204	28.24
II	Male	57	29.38	66	28.66	123	28.99
	Female	39	30.45	26	29.34	65	30.00
	M+F	96	29.81	92	28.85	188	29.34
V	Male	65	34.57	83	32.93	148	33.65
	Female	32	34.37	31	33.32	63	33.90
	M+F	97	34.54	114	33.03	211	33.72

The correlations between Hindi achievement test scores and mosaic test total rating scores are .260 ($n=204$) for all Grade I children, .293 ($n=188$) for all Grade II children, and .168 ($n=211$) for all Grade V children. Likewise, the correlations between mathematics achievement test scores and mosaic test total rating scores are .336 for Grade I children, .229 for Grade II and .184 for Grade V children. It is clear that performance in mathematics and the mosaic test is more highly correlated than in Hindi and the mosaic test.

We may now look into the nature of the correlation between independent and intervening variables on one hand and three dependent variables on the other, viz. performance in Hindi, mathematics and the mosaic test. These are shown in Table 18.

Let us consider the correlation values grade by grade.

In Grade I, the two composite independent variables, LinSES and LinSEC, have uniformly moderate valued correlations with the three independent variables. The same is true of IQ and Moral Relativism. But Social Maturity and Sociometric Status Index have usually low, and near zero correlations with the three dependent variables. Further, correlation between Mosaic Test Rating and the other variables is generally lower than those between the other two variables.

The picture is repeated in Grades II and V. Only most of the correlation values, with a few exceptions, have tended to have slightly lower values. But the variable Sociometric Status Index appears to have improved its position in Grade V, over that in Grades II and I.

The correlation values with LinSES, LinSEC, IQ and Moral Relativism,

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TABLE 18
PRODUCT-MOMENT COEFFICIENTS OF CORRELATION BETWEEN TWO
COMPOSITE INDEPENDENT VARIABLES AND FOUR INTERVENING
VARIABLES ON ONE HAND AND THE THREE DEPENDENT
VARIABLES ON THE OTHER, FOR THE THREE GRADES

<i>Independent and intervening variables</i>	<i>Dependent Variables</i>			<i>Total Rating</i>
	<i>Hindi</i>	<i>Mathematics</i>	<i>Mosaic</i>	
Grade I. M+F, U+R. N=204				
1. LinSES	.389	.479		.268
2. LinSEC	.308	.369		.192
3. I.Q.	.313	.353		.184
4. Social Maturity	.003	.110		.078
5. Moral Relativism	.294	.367		.122
6. Sociom Stat. Index	.073	.059		.134
Grade II. M+F, U+R. N=188				
1. LinSES	.454	.248		.232
2. LinSEC	.232	.066		.179
3. I.Q.	.344	.175		.160
4. Social Maturity	.085	.072		.033
5. Moral Relativism	.206	.229		.095
6. Sociometric Stat. Index	.051	.053		-.044
Grade V. M+F, U+R. N=211				
1. LinSES	.351	.263		.084
2. LinSEC	.276	.109		.122
3. I.Q.	.303	.331		.161
4. Social Maturity	-.081	-.073		.026
5. Moral Relativism	.404	.335		.053
6. Sociometric Stat. Index	.213	.279		.088

in most cases, are not too high, but, due to the large size of samples upon which these are based, they are quite stable, and most of them are statistically significant.

Multivariable Prediction of Performance in Dependent Variables : The fact that, in each grade, there is a moderate correlation between the independent and variables on the one hand, and the three dependent variables—performance in Hindi, mathematics and mosaic tests on the other means that we can assume the existence of a functional dependence of the achievement tests upon the scores in the independent and intervening variables. This fact of the existence of a functional dependence between the two sets of variables can be utilized for predicting performance in Hindi, mathematics and the mosaic test, in each of the three grades, by computing appropriate multiple regression equations.

For predicting performance, say in Hindi, we make use of the correlation between the Hindi test and the two independent variables, LinSES and LinSEC and the four intervening variables, IQ, social maturity, moral relativism, and social acceptance. The dependent variable that is being predicted, also called the criterion variable, is usually symbolized as Y , and the different predictor variables are represented as X_1 X_2 X_3 etc. In the regression equation, Y is shown as a function of the properly weighted linear sum of the different predictor scores. For the present study, for each of the three criteria—Hindi, mathematics, and mosaic test (total rating), the regression equations, by using only two predictor variables, LinSES and LinSEC, were computed. Next, the same regression equations were calculated by using the four intervening variables as well. These regression equations, with all the six predictors, are shown below, grade by grade, for the three criterion variables.

REGRESSION EQUATIONS

I. Prediction of Performance in Hindi (Y^1_H)

$$\text{Grade I. } Y^1_H = 1.31X_1 + 2.21X_2 + .30X_3 - .01X_4 + 1.35X_5 \\ - .03X_6 - 26.64$$

$$\text{Grade II. } Y^1_H = 1.55X_1 + 1.06X_2 + .30X_3 + .01X_4 - .60X_5 \\ - .01X_6 - 36.64$$

$$\text{Grade V. } Y^1_H = .48X_1 + 1.51X_2 + .13X_3 + (.00X_4) + 1.11X_5 \\ + .06X_6 - 10.98$$

II. Prediction of Performance in Mathematics (Y^1_M)

$$\text{Grade I. } Y^1_M = .63X_1 + .95X_2 + .11X_3 + (.00X_4) + .67X_5 \\ - .02X_6 - 15.76$$

$$\text{Grade II. } Y^1_M = .21X_1 - .22X_2 + .04X_3 + (.00X_4) + .30X_5 \\ + (.005X_6) + .41$$

$$\text{Grade V. } Y^1_M = .13X_1 - .11X_2 + .05X_3 - (.00X_4) + .30X_5 \\ + .02X_6 - 1.27$$

III. Prediction of Performance in Mosaic Test (ratings) (Y^1_B)

$$\text{Grade I. } Y^1_B = 1.56X_1 - 1.60X_2 + .22X_3 + .01X_4 + .12X_5 \\ + .13X_6 + 219.82.$$

$$\text{Grade II. } Y^1_B = 1.51X_1 - 2.99X_2 + .31X_3 - (.00X_4) + .54X_5 \\ - .07X_6 + 224.73.$$

$$\text{Grade V. } Y^1_B = .19X_1 + 4.22X_2 + .24X_3 + .02X_4 - .12X_5 \\ + .07X_6 + 266.23.$$

In all the above regression equations, X_1 stands for LinSES, X_2 for LinSEC, X_3 for IQ, X_4 for social maturity, X_5 for moral relativism, and X_6 for sociometric status index. It is noteworthy that the regression weight

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for social maturity, X_4 , is usually very small, or zero, showing that it contributes little to the overall prediction of the criterion score.

It may be asked : How good are these multiple regression equations in predicting the criterion score in Hindi, mathematics, or the mosaic test ratings ? We may find out the square of the highest correlation that a criterion has with any of the six predictor variables. Next, we may compute the square of the multiple correlation coefficient, R , obtained by using only two predictor variables—LinSEC and LinSES. Then we may compute the square of the multiple correlation coefficient, R , obtained by using all the six predictor variables. The gains of the two R^2 values over the single-predictor r^2 values will indicate how good the regression equations are because these gains represent the additional variance of the criterion variable that can be accounted for by the variance in the predictor variables that have been used in the multiple regression equation.

In Table 19, the zero-order r values, and the two-predictor and six-predictor R values, their respective squares, and the gains in accounting for additional amount of variance, as a percentage, have been shown for the three criterion variables and the three grades.

TABLE 19
VALUES OF ZERO-ORDER R , 2-PREDICTOR R , AND 6-PREDICTOR R , THEIR SQUARES, AND THE GAINS IN ACCOUNTED-FOR VARIANCE OF THE CRITERION VARIABLE FOR THE THREE CRITERION VARIABLES FOR EACH OF THE THREE GRADES

Criterion Grade		Highest zero-order r with any single predictor	Multiple R with 2-predictor variables (R_2)	Multiple R with 6-predictor variables (R_6)	r^2	R_2^2	R_6^2	$R_2^2 - r^2$	Gains	
									$R_2^2 - R_6^2$	$R_6^2 - R_2^2$
Per cent										
Hindi	I	389	402	488	15.1	16.2	23.8	1.1	8.7	7.6
Hindi	II	454	456	585	20.6	20.8	34.8	0.2	14.2	14.0
Hindi	V	351	500	545	12.3	25.0	29.7	12.7	17.4	4.7
Maths	I	479	493	579	22.9	24.4	33.6	1.5	10.7	9.2
Maths	II	248	250	358	06.2	06.3	12.8	0.1	6.6	6.5
Maths	V	262	270	506	06.9	07.3	25.6	0.4	18.7	18.3
		(.335)*								
Mosaic	I	268	295	311	07.2	08.7	09.7	1.5	2.5	1.0
Mosaic	II	232	249	302	05.4	06.2	09.1	0.8	3.7	2.9
Mosaic	V	122	123	218	01.5	01.5	04.7	0.0	3.2	3.2
		(.161)**								

*This is the zero-order r with moral relativism

**This is the zero-order r with IQ.

The gain in prediction, by using the properly weighted combination of the two independent variables, LinSES and LinSEC, is greatest for Hindi and least for the mosaic test, with mathematics in an in-between position. The proportion of gain in predicting the criterion variance is usually small, but is quite appreciable for mathematics in Grade V, where the increase in accountable criterion variance is 12.7 per cent. If all the six predictor variables are used, predictability of the criterion scores increases considerably. The gain in predictive efficiency also goes up substantially. The gain is as high as 18.7 per cent for mathematics in Grade V, and 17.4% for Hindi in Grade V. The gain in predicability in the mosaic test score is relatively quite small. It is quite clear that Hindi and mathematics performance can be predicted with a fair degree of accuracy, on the basis of information about home background factors measured by LinSES and quality of schooling measured by LinSEC.

DISCUSSION OF FINDINGS

Impact of Family Background and Quality of Schooling

In the scheme of analysis followed in this study, what is called 'within group' differences among schools belonging to the same type of location, urban or rural, have not been taken into account. Two types of differences between schools have been taken into account—location of these schools either in the urban or rural areas, and the academic excellence of the schools, in terms of teacher qualification, teacher-pupil ratio, and school facilities and equipment. From the mass of results pertaining to group means, when groups vary in homogeneity with regard to sex, location, and age-grade, and naturally with regard to size, a clear-cut trend is discernible. In Grade I, it appears there are little systematic differences between different groups of children—male or female, rural or urban, good schools or bad schools. But by the time Grade V is reached, the situation crystallizes sufficiently to produce a systematic differential in favour of the more advantaged groups—males tend to do better than females, city pupils tend to do better than rural pupils, and better schools, which have more children from better, advantaged homes, do better than poorer schools. This is true not only for school subjects like Hindi and mathematics, but also for a culture-free performance projective test like the mosaic test, as well as in psychological variables like intelligence, social maturity, moral development and social acceptability. What needs to be realized here is the fact that even after schools have been categorized in terms of rural-urban location, and trichotomized in terms of good-average-poor levels, as indexed

by the composite LinSEC score, *certain variations still remain among the schools themselves*, which the present statistical analysis has not taken into account. Granting the inherent variability within the set of schools sampled in this investigation, the 'durable fact remains that both location of schools, and their academic quality, have considerable impact upon children's school performance as well as their psychological functions, though to a lesser extent. There is need of caution in interpreting such obvious, or too obvious, findings. For example, how much of the superiority of the urban school children over the rural school children is due to cultural factors related to location, and how much to the fact that in the rural group of 16 schools, there were many more poor and average schools than in the urban sample of 15 schools? There have been many instances of a significant location X school excellence interaction in the analysis of variance findings, which is a loaded result, following from the inevitability of the objective quality of the situation. Rural schools, by and large, are traditionally no match for urban schools, despite certain advantages enjoyed by them in terms of space, surroundings, etc. There is nothing like a 'good' school in rural areas which could be a match for the 'good' schools in urban areas. These are predicated by social-cultural-economic conditions of the society, and will find expression in the quality of education imparted to the children studying in them. The findings of the present study have only confirmed a hard sociological reality known since long.

This study confirms that by and large, the most important single factor contributing to the educational and cognitive-perceptual functioning of the young school-going child is the level of stimulation provided by his home and family. All the indicators of what is known as the composite socio-economic status jointly account for much of the variance in the child's performance in school subjects like language and mathematics, as well as in imaginative-organizational tasks such as the mosaic test. This fact is amply borne out by the fact that the zero-order correlation of LinSES (which is equivalent to whatever is generally measured by any scale measuring socio-economic status) with most other variables, especially the achievement tests, various measures derived from the mosaic designs, and also the intervening variables covering some basic social-psychological-personality dimensions, are generally positive and of substantive size. Additional supportive evidence of the importance of LinSES measures is provided by the results of the multiple regression analysis.

The contribution of the qualitative level of 'schooling' is only next to that of social and family background factors, in exercising impact on the educational and psycho-social development of the child. It is clear that, in a given socio-economic background, performance of the children and their psycho-social development can be improved substantially by improving the level

of 'schooling'. Besides, all students will stand to gain something. It amounts to stressing the obvious by pointing out that the general socio-economic conditions of the masses can be improved only by a many-pronged national effort with commensurate economic input. But a fraction of the resource spent on improving the quality of schools will result in overall increase in the educational attainment level of all children.

It has been found that while each of the separate components of LinSES correlates appreciably with the achievement test and mosaic test variables, the correlations for the rural groups tend to be lower than those for the comparable urban groups. Further, these correlations tend to dwindle in size, as we go from Grade I through Grade II to Grade V. This is not pronounced in the correlation values of LinSEC with the same variables from lower age-grades to higher age-grades, though some reduction is observed in going from the urban to the rural groups. What is the explanation for this peculiar age-grade related decrease in correlation between LinSES and LinSEC on one hand, and the achievement variables on the other? We may note that the high correlations in lower age-grade groups, in case of components of LinSEC, are reduced little, or not at all, in the higher age-grade groups, showing that the level of educational benefit derived by the children from the schooling they are undergoing is sustained in higher grades, while the influence of the home factors either tapers off or may even decrease with the increasing maturity of the children. But the reduction of the correlation values in rural groups in contrast to urban groups, both for family background factors and school facility factors, is not easily explained. One tentative explanation is that the rural society exercises a levelling influence, which may be absent in the urban culture. In fact, the urban environment may act in an opposite fashion. By fostering competition and disparity, it may increase the variability within the group, with concomitant rise in the correlation between pairs of variables. That urban groups, both male and female, show greater variability, is amply borne out by the standard deviations that have been calculated for both groups. Thus we encounter another telling instance of sociological determinism: there is something in urban environmental conditions that tends to foster variability among students. To put it in another way the rural environment does not foster variability and individual differences among children to the extent the urban environment does.

It has been noted that in general there is a tendency for intervariable coefficients of types of pairs to be lower for females compared to those for males. This can be traced to the curtailment of variability among females compared to males. There may be ingredients in our culture which foster greater competitiveness among male children compared to female children. Granted this factor may exercise its influence in co-educational schools,

where girls may tend to be more submissive than boys. But what about girls' schools, where, within the school environment, competitiveness may be fostered with equal vigor as in comparable boys' schools? It seems that the influence of socio-environmental cultural factors in increasing intra-group variability among urban children is related more to socio-economic and family factors, than to quality of schooling. In rural areas, quality of schooling can in part compensate for the disadvantage of cultural impoverishment that the rural environment may entail.

A Further Look into Differential Development—Psychological and Academic

In a nutshell, we have noted that in Grades I and II, differences between rural and urban children are but slight; the females do as well as the males; children from poor schools are as good as those from good schools; and children of higher socio-economic status are not much better than those from poorer homes. But by the time we reach Grade V, a reversal takes place: urban children do much better than rural children; boys do much better than girls; and children who are more advantaged in terms of socio-economic status and studying in good schools, outstrip those who are less advantaged on these counts. A closer look at this peculiarity of developmental locus of children, who start out on a basis of equality, is called for.

The slight but consistent rise in mean I.Q. values from Grade I through Grade II to Grade V, is perhaps an outcome jointly determined by two factors—one inherent in the measuring instrument, and the other in the operation of a selection process. By the time Grade V is reached, the duller children drop out, more so in rural areas than in urban areas, and more children belonging to poorer families than to affluent families.

Coming to moral development, we find that average moral relativism scores for the three Grades are as follows: 11.40 for Grade I, 12.19 for Grade II and 14.74 for Grade V. There is a slight but systematic difference between urban and rural groups—with the advantage going to the urban children. The averages for the three urban age-grades are 12.19, 12.25 and 15.15 respectively, compared to 10.52, 12.13 and 14.22 for rural schools.

Why should the rural children as a group be somewhat deficient to the urban children in terms of average moral relativism scores? One reason may be a comparative lack of exposure of rural children to experiences—theoretical and actual—of moral and immoral, ethical or unethical conduct. The urban children's environment, in this matter, might be more varied and 'enriched'. Most probably the frequency of petty crimes, violent quarrels, deviational behaviours, immoral and unethical acts, is greater in urban areas

compared to rural areas. The urban children, being exposed to them, may develop relatively greater discriminatory responses fairly early.

It may be pointed out here that the instrument for measuring social maturity did not fare well, in terms of discriminating between groups, or in predicting performance in school subjects. The reason may be that the social maturity score was obtained as a rating from the teachers. These ratings might have contained a lot of errors, reducing both reliability and validity of this instrument.

Home and School Interaction

Child development is a joint function of two sets of shaping factors—one emanating from the home-family-neighbourhood conglomerate, and the other from the school-teacher-peer-group cluster. Some of the factors may operate in the same direction, some are opposed to each other, and some may be independent of each other. It has been found that all components of LinSES correlate appreciably, and positively, with all components of the LinSEC. Naturally, LinSES and LinSEC are also correlated appreciably with each other. In the scheme of multivariate predictions, the two best variables for predicting the criterion variables happen to be LinSES and LinSEC. Statistically, this would have been ideal for accuracy of prediction of the criterion but for one snag—presence of appreciable correlation between LinSES and LinSEC. In effect this means that children from disadvantaged homes attend the academically poorer schools, and children from better homes attend the better schools. Add to this the fact that in rural areas there are more relatively poor schools than in urban areas. These two factors working together, would tend to accentuate the urban-rural differential.

We may recall that among urban schools, there is one school with a LinSEC score of 4, five schools with a LinSEC score of 5, three with a score of 6, three with a score of 7, two with a score of 8, and one with the highest LinSEC score of 9. Against this, among the rural schools, there are two schools with a LinSEC score of 3, four with a score of 4, seven with a score of 5, two with a score of 6, and one with a LinSEC score of 7. *There is no rural school with a LinSEC score of 8 to 9.*

Again, we note that 20 per cent of the students of the urban sample have LinSES scores ranging from 29 to 42, and it is this more advantaged group which is enrolled in the better type of schools. On the other hand, in the rural schools, none of the students had LinSES scores exceeding 28. In fact, no less than 45 per cent of the students of the rural schools had LinSES scores ranging from 2 to 19. The differential weighting that inevitably occurs in favour of about 20 per cent of the urban sample of children cannot thus be

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denied. There were actually three schools with LinSEC scores of 8 and 9, in which were enrolled exactly 11.6 per cent of the total sample—all of whom belonged to the urban category. Then there were three schools in the urban set and a single school in the rural set, in which were enrolled 89.9 per cent of the entire sample. Thus about a fourth of this 12.9 per cent, that is $3\frac{1}{4}$ per cent of rural students, had the type of educational advantage enjoyed by the advantaged section of the urban students. Thus it turns out that approximately 22 per cent of the urban children, as compared to about $3\frac{1}{4}$ per cent of the rural children, had the advantage of 'good schooling'. And we have seen that enrolment in the better type of schools tends to be monopolized by children from the more affluent sections of the urban community. Thus, some of the rural-urban differential seems to be compounded by deep-seated socio-economic structural factors, which are not directly related to the educational process or the psychological maturational process. We conclude by emphasizing that the major finding of the present study is a confirmation of the operation of socio-economic determinism, of the differentiation that tends to become apparent among school children, even if they start out with equal genetic equipment.

In the present study, which was quite massive in scope, data on the differential impact of the home and the school on intervening psychological functions like intelligence, social maturity, moral development and social acceptance, have been collected. But how these intervening variables are monitored—in a multivariant manner—by the impact of home and school conditions, has not been comprehensively calculated, as has been done for the dependent variables, comprising the achievement tests in Hindi and mathematics, and the Mosaic test. Given time and opportunity, these can also be computed to gain additional insight into the complex processes of psychological and educational development. □

School Teachers : Job Satisfaction vs. Extraversion and Neuroticism

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This study involves 591 (320 men and 271 women) teachers teaching in Government and Government aided higher secondary schools of Delhi. A job-satisfaction scale prepared by the investigator and the Maudsely Personality Inventory were applied. It was found that in general, women teachers enjoy a higher level of job satisfaction than men. Expressed in percentages, 64.71 per cent men, 28.02 per cent women and in all 52.50 per cent teachers (both sexes) were found to be dissatisfied with their jobs.

The mean scores of extraversion and neuroticism obtained by men and women teachers do not differ significantly. However 591 teachers, irrespective of their sex, scored higher on extraversion than on neuroticism. This mean difference in favour of extraversion is significant.

Age, sex, experience in years, extraversion and neuroticism were examined to the extent to which they determined the job satisfaction of school teachers. It was found that 30 per cent teachers' job-satisfaction was determined by their possession of a degree of extraversion whereas sex accounted for only 9 per cent. Years of experience and age were found to play no role in the determination of job satisfaction of school teachers, whereas neuroticism was negatively related to it.

SCHOOL TEACHERS' JOB SATISFACTION

"JOB SATISFACTION comprises those outward or inner manifestations which give an individual a sense of enjoyment or accomplishment in the performance of his work. Job satisfaction may come from the product or item produced, from the speed with which it is accomplished or from other features relating to job and its performance" (Roberts, 1966). Job satisfaction is a complex phenomenon with several interrelated factors: personal, social, cultural and economic. A significant contribution in the study of job satisfaction is the two-factor theory of Herzberg and others (1957). The two-factor theory postulates two different sets of factors—motivators and hygienic, influencing job satisfaction and dissatisfaction. Schaffer (1953) studied job satisfaction as related to need satisfaction among 72 employed men, most of whom were in professional and semi-professional occupations. His theory, formally stated, is that overall satisfaction will vary directly with the extent to which those needs of an individual which can be satisfied in a job are actually satisfied; the stronger the needs, the more closely will job satisfaction depend on their fulfilment. The most accurate prediction of overall job satisfaction can be made from the measure of the extent to which a person's strongest needs are satisfied.

The 12 needs that are considered are :

- a) Recognition and approbation;
- b) Affection and interpersonal relationship;
- c) Mastery and achievement;
- d) Dominance;
- e) Social welfare;
- f) Self expression;
- g) Socio-economic status;
- h) Moral value scheme;
- i) Dependence;
- j) Creativity and challenge;
- k) Economic security;
- l) Independence.

Roar (1958) sees the job as a source of satisfaction of many needs. "When I speak of the job, I mean not only what he does but the total setting within which he does it. A major part of most jobs, in terms of satisfactions to be derived from them, is the social interaction and social status which is linked to the job. To understand how a man functions in a job one must know what his needs are and how they are satisfied". Roar accepts Maslow's concept of the hierarchy of needs and lists them in the following order :

- i) The physiological needs;
- ii) The safety needs;
- iii) The need for belongingness and love;
- iv) The need for importance, respect, self-esteem, independence;
- v) The need for information;
- vi) The need for understanding;
- vii) The need for beauty;
- viii) The need for self-actualization.

Hoppock (1967) concludes in his *Composite Theory for Counsellors* that job satisfaction depends upon the extent to which the job that we hold meets the needs that we feel it should meet. The degree of satisfaction is determined by the ratio between what we have and what we want. Satisfaction can result from a job which meets our needs today or from a job which promises to meet them in future.

Of all the different factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. Nothing is more important than securing a sufficient supply of high-quality recruits to the teaching profession, providing them with best possible preparation and creating satisfactory conditions of work in which they can be fully effective. In creative work like teaching, job satisfaction remains the *sine qua non* and plays a very significant role in attracting and retaining the right type of persons in the profession. Job satisfaction enables teachers to function at their highest level of efficiency. In his investigation, Anjancyula (1968) showed that satisfied teachers contributed to a larger number of excellent, good and average ratings on pupils' qualities and behaviour than dissatisfied teachers. Dissatisfied teachers contributed to a greater number of poor and below average ratings. Samantarory (1971) has shown that there existed some degree of positive relationship between the variables teacher attitude and teaching efficiency, thereby showing that superior efficiency goes with a favourable attitude and vice versa. Anand (1971) has shown that students' liking for teachers and teachers' liking for students are positively related with the job satisfaction of teachers.

The present study seeks to study the following questions :

- 1) Level of job satisfaction enjoyed by teachers;
- 2) Number of teachers satisfied and unsatisfied;
- 3) Degree of extraversion and neuroticism among the teachers;
- 4) Determinants of the job satisfaction of school teachers.

Tools

The following two tools were used in this study :

- i) Job-satisfaction scale (prepared by the author, described in

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- author's reference 1972).
ii) Maudsley Personality Inventory (MPI)

Sample

Five hundred and ninety-one teachers, including trained graduate and post graduate teachers (320 men and 271 women), teaching various subjects in Government and Government-aided higher secondary schools of Delhi, constituted the sample for this study. These teachers were contacted in various summer institutes held in 1975. This selection of the sample therefore delimits the validity of the findings of the study.

ANALYSIS AND INTERPRETATION

Level of Job Satisfaction

The job-satisfaction scale prepared and applied by the investigator consists of 40 statements. The agreement of a teacher to 20 statements depicts his satisfaction whereas agreement to the rest of the 20 statements depicts dissatisfaction. The score of this scale ranges between 0 to ± 120 .

TABLE 1
DISTRIBUTION OF JOB SATISFACTION SCORE

Range	Number of Teachers		Total
	Men	Women	
110-119	2	0	2
100-109	4	19	23
90-99	34	55	89
80-89	73	94	167
70-79	80	60	140
60-69	57	31	88
50-59	44	8	52
40-49	21	4	25
30-39	4	0	4
20-29	1	0	1
Total	320	271	591

From this table the following statistics have been calculated:

Teachers	Number	Mean	S.D.
Men	320	72.38	15.53
Women	271	81.95	15.53

$\sigma D = 1.23$; $CR = 7.78$; Significant at .01 level

It is inferred that in general women teachers possess a higher level of satisfaction than men teachers. There is a significant difference between the satisfaction enjoyed by women and men teachers at their jobs. Service conditions, salary and work-load remaining the same, it seems quite surprising that women teachers are more satisfied than men. It seems as if the men have accepted their jobs and continue to work against their will. It may be because of the fact that our society accords respect to women taking up school-teaching, whereas men teachers are not held in high esteem.

From Table I, three levels of job satisfaction can be considered as under:

<i>Score on Job Satisfaction Scale</i>	<i>Level of Job Satisfaction</i>
80-120	I
40-79	II
0-39	III

TABLE 2
TEACHERS IN THREE LEVELS OF JOB SATISFACTION

<i>Satisfaction</i>	<i>Number of Teachers</i>		
<i>Level</i>	<i>Men</i>	<i>Women</i>	<i>Total</i>
I	113 (35.32%)	168 (62%)	281 (47.55%)
II	202 (63.12%)	103 (38%)	305 (51.60%)
III	5 (1.56%)		5 (0.85%)
Total	320	271	591

Chi-square for two degrees of freedom=33.228 significant at .01 level.

Three levels of job satisfaction, contained in the distribution of equal range of scores of 40 in the scale, substantiate the running interpretation. There are 62 per cent women and only 35.32 per cent men teachers who are found in satisfaction level I. Obviously this percentage difference is significant. On the contrary, job satisfaction level II contains 38 per cent women and 63.24 per cent men—the percentage difference continues to be significant. It may also be noted that five men and none of the women teachers are placed in level III. The chi-square test of independence confirms this. The value of chi-square is found to be significant at .01 level, which shows that the number of teachers placed in the three levels of satisfaction is not independent of their sex. A significantly greater number of women teachers have been found to enjoy job satisfaction level I, whereas the bulk of men teachers enjoy level II. This is similar to findings about teachers in Australia (Holdaway 1972).

Number of Teachers Found Satisfied and Dissatisfied

The mean scores of 320 men and 271 women teachers have been found to be 72.38 and 81.95 respectively. The general mean score is calculated to be 76.76. In view of these values, it was considered quite rational to set the score of 80 (75 per cent of the maximum possible) as that of a teacher satisfied at his job.

TABLE 3
STANDARD ERROR OF DIFFERENCE BETWEEN
SATISFIED AND DISSATISFIED TEACHERS.

<i>Teachers</i>	<i>Satisfied</i>	<i>Dis- satisfied</i>	<i>*6%</i>	<i>Confidence interval at .01</i>
Men	113(35.30%)	207(64.71%)	2.64	\pm 6.81
Women	168(61.98%)	103(28.02%)	2.95	\pm 7.61
Total	281(47.50%)	310(52.50%)	2.05	\pm 5.29

* Standard error of percentage

Standard error of difference between satisfied men and women (percentage numbers) is found to be significant, ($CR=2.60 > .81$ level). It is found that a significantly greater number of women teachers are satisfied than men teachers. Chi-square is calculated to be 41.56, inferring thereby that the number of satisfied teachers is dependent upon their sex. This finding is in line with the findings of Anand (1972) and Rana (1973).

It is a matter of great concern that in all 52.50 ± 5.29 per cent teachers are found to be dissatisfied at their jobs. This is very disturbing as their being satisfied at their jobs is the sole determinant of the quality of schooling. A thorough study on the mental health of teachers is called for to investigate into the causes of dissatisfaction and the remedial measures to be taken. Job satisfaction is not necessarily the same as pleasure in the activities involved; it may be satisfaction with the pay, the general surroundings, the social position or all of these combined. Also, dissatisfaction may arise due to lack of ability, capacity or interest. It may also be due to a unrealistic attitude adopted by the individual. We cannot hope for good results from the implementation of educational reform in the country with 64.71 ± 6.81 per cent of men teachers working at their jobs without satisfaction. Teachers on their part may make willing and consistent efforts to adjust and feel satisfied at their school teaching jobs or take an early decision to make room for new entrants.

Degree of Extraversion and Neuroticism among Teachers

Degree of extraversion relates to freedom from worries, conservatism, interest in athletics, fluency in speech, friendliness, pleasure in working for and with others, and flexibility. Degree of neuroticism relates to inadequacy and low stress tolerance, anxiety and fearfulness, tension and irritability, egocentricity and disturbed interpersonal relationships, persistent non-integrative behaviour, lack of insight and rigidity, dissatisfaction and unhappiness. Cattle and Scheies (1961) have pointed out "...a neurotic person is only a person (suffering from) external and internal difficulties and inadequacies from which every one suffers in some degree. He chronically over-reacts to life stress and resorts to exaggerated defensive measures which are ineffective in coping with his problems."

TABLE 4
TEACHERS' SCORES ON MAUDSELY PERSONALITY INVENTORY

Range	Men	Neuroticism Women	Total	Men	Extraversion Women	Total
25-48	0	0	0	1	0	1
40-44	7	6	13	15	13	28
35-39	13	14	27	45	37	82
30-34	36	24	60	99	78	177
25-29	27	25	52	72	71	143
20-24	60	68	128	63	51	114
15-19	53	49	102	20	15	35
10-14	66	48	114	5	3	8
5-9	39	30	69	0	3	3
0-4	19	7	26	0	0	0
Total	320	271	591	320	271	591

From this table, the following statistics for 320 men and 271 women teachers were calculated:

Teachers	Extraversion Mean	S.D.	Mean	Neuroticism S.D.
Men	28.87	6.95	18.70	10.90
Women	28.65	6.66	19.70	9.13
Total	28.77	6.75	19.16	9.95

SCHOOL TEACHERS' JOB SATISFACTION

The mean scores of extraversion and neuroticism obtained by men and women teachers do not differ significantly. However 591 teachers, irrespective of their sex, score higher on extraversion than on neuroticism. This mean difference, 9.61 in favour of extraversion, is significant ($D = .494$, $CR = 19.61$) at .01 per cent level. It is a welcome finding that teachers in general are more extroverted than neurotic. This conclusion is in agreement with the findings of Ahuja (1974).

From Table 4, three degrees of extraversion and neuroticism can be visualized as under :

Degree	Standard Score
High	35-48
Average	20-34
Low	0-19

TABLE 5
TEACHERS POSSESSING THREE DEGREES OF
EXTRAVERSION AND NEUROTICISM

Degree	Neuroticism			Extraversion		
	Men	Women	Total	Men	Women	Total
High	20 (6.25%)	20 (7.38%)	40 (6.76%)	61 (19.06%)	50 (18.46%)	111 (18.78%)
Average	123 (38.43%)	117 (43.17%)	240 (40.61%)	234 (73.12%)	200 (73.79%)	434 (73.44%)
Low	177 (55.32%)	134 (49.45%)	311 (52.63%)	25 (7.81%)	21 (7.75%)	46 (7.78%)

There are 311, i.e. 52.63 per cent teachers who possess a low degree of neuroticism, whereas there are only 46, i.e. 7.78 per cent teachers who possess a low degree of extraversion. Both the statistics are encouraging. They can be interpreted to mean that teachers in general are in good mental health. The figures in the table, at the high degree level of the two dimensions of the personality, further substantiate the healthy mental state of the teachers. It is quite encouraging that while 111, i.e. 18.78 per cent of the teachers are found at the high degree level of extraversion, there are only 40 i.e. 6.76 per cent teachers who are found to suffer from a high degree of neuroticism. There are 434, i.e. 73.44 per cent teachers possessing an average degree of extraversion whereas there are only 240 i.e. 40.61 per cent teachers who possess an average degree of neuroticism.

Determinants of Job Satisfaction in the Schools

For factory workers, Rao (1970) had found that four factors—age, income, length of service, and tenure had no association with job satisfaction. Education, caste and skill were found to have a strong association with job satisfaction. Marital status showed a significant association with satisfaction. Sergioranni (1967) has reported that the satisfaction factors for teachers tended to be linked to the work itself and the dissatisfaction factors tended to be linked to the conditions of work. Tiffin (1948) quotes the findings of Roberts which show the importance of moral factors to such factors as promotion, procedures, favouritism and company policies. A study by Blum (1942) also showed that certain non-monetary factors—job security and advancement—ranked above pay in their influence upon employee morale. Super (1939) had found that amount of change in status was of little importance in effecting an increase in job satisfaction but the direction of change was of vital importance. Anand (1972) had found that age, sex and salary were significantly related to job satisfaction. It was revealed that academic attainments of teachers, whether private or regular, and their performance in school, college or university, were not significantly related to their job satisfaction. One of the first studies on job satisfaction by Fisher (1931), which dealt with neuroticism, found the two to be negatively related.

In this investigation, the following factors have been examined to study the extent to which they determine job satisfaction of school teachers :

- 1) Age;
- 2) Sex;
- 3) Experience (in years);
- 4) Extraversion;
- 5) Neuroticism;

TABLE 6
MATRIX OF COEFFICIENTS OF CORRELATION BETWEEN
JOB SATISFACTION AND OTHER VARIABLES

	Age 1	Sex 2	Experi- ence 3	Extra- version 4	Neuroti- cism. 5
<i>Job satisfaction</i>					
1	-.022	.301	.000	.549	-.115
2		.279	.286	-.094	-.061
3			.194	.017	.050
4				.050	-.053
					-.085

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The Doo Little method of Multiple Correlation (Garrett, 1969) has been used to arrive at the regression equation as under :

$$\begin{aligned} Z_C &= .554Z_4 + .295Z_2 + .115Z_6 \\ R^2 &= .554 \times .549 + .295 \times .301 + .115 (-.115) \\ &= .304 + .088 + .013 \end{aligned}$$

It is found that job satisfaction bears maximum positive correlation with extraversion and sex comes next to it. Neuroticism is negatively related to it. It is found that job satisfaction is not attained merely by working long at the jobs. Extraversion is an attitude of the mind. It is inferred that it is the personality of a person which determines job satisfaction in the profession of school teaching.

From the regression equation it is inferred that 30 per cent of the teachers' job satisfaction is determined by their possession of extraversion whereas sex accounts for 9 per cent. Years of experience and age are found to play no role in the determination of the job satisfaction of school teachers. Herzberg (1957) in his review of 17 research studies pointed out that "workers begin with high morale, which drops during the first five years of service and remains low for a number of years. As service increases morale tends to go up". This study does not corroborate this. For school teachers, besides the degree of extraversion and sex, their salary, status in the society and their values of life may be looked into for the extent these account for their job satisfaction.

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The Changing Concept of Educational Administration

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*If education does not perform everything,
there is hardly anything which it does not perform.*

—JAMES MILL

THE IMPORTANCE of this far-reaching truth has begun to be realized only in recent years. In the past, we paid lip-service to the vital service of educational administration—a service on which the progress of a country depends.

Educational administration is rapidly changing. In the past, an experienced teacher was usually required to administer the educational programme on an institution. The policies depended on current policies and practices rather than upon sound principles or theories of education. As such, educational administration merely meant carrying out plans and policies to the best of one's ability.

Gradually the inadequacies of this concept of educational administration have been recognized. Administration according to one's own whims involved an autocratic attitude, and hence deserved no place in education. Later on, it was realized that educational administration was a special type of activity and to perform it successfully trained personnel were required.

Educationists differ as regards the meaning of educational administration. The present paper is an attempt to ascertain the changing concept of educational administration. If similar efforts are continued and as a result a consensus is reached on the definition of educational administration, it may

be possible to enumerate major variables involved in the administrative situation, and thus work towards making the consequences of administrative actions more predictable. Till the turn of the present century, educational administration was looked upon as an extremely simple and straightforward matter.

According to Ordway Tead, administration means the art of getting things done. He gives a definition which not only explains administration but also leads towards an understanding of what is good or poor administration. He says :

Administration is conceived as the necessary activities of those individuals (executives) in an organisation who are charged with ordering, forwarding, facilitating the associated efforts of a group of individuals brought together to realisation of defined purposes.¹

It is clear that good administration involves concerted efforts in realizing defined goals. Griffiths opines that :

- a) administration is a generalized type of behaviour and is found in all organizations;
- b) administration is a process of directing and controlling life in a social organization;
- c) the central purpose of administration is to develop and regulate the decision-making process; and
- d) administration works with groups and not with individuals.

The purpose of educational administration is, in the words of Sir Graham Balfour, to enable the right pupil to receive the right education from the right teacher, at a cost within the means of the State, under conditions which will enable the pupils best to profit by their learning. Educational administration can be more easily understood if we make an analysis of the purposes for which it is needed. Very simply, the purpose of educational administration is to facilitate teaching and learning. Educational administration "consists of facilitating the development of goals and policies basic to teaching and learning, stimulating the development of appropriate programmes for teaching and learning and procuring and managing personnel and material to implement teaching and learning."²

Russell T. Gragg, in his article on administration in the *Encyclopaedia of Educational Research*, goes further and considers that educational administration is also concerned with the growth of adults.

¹Ordway Tead. *The Art of Administration*, London : McGraw Hill Book Co. Inc. 1951, p. 4

²Renold F. Campbell, John E. Corabally, (Jr.) Ramseyer. *Introduction to Educational Administration*. New York : Allyn and Bacon. Inc., 1958, p. 178

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Educational administration is the process of utilizing appropriate materials in such a way as to promote effectively the development of human qualities. It is concerned not only with the development of children and youth, but also with the growth of adults and particularly with the growth of school personnel.³

Frederick Taylor, Henri Fayol, Mary Parker Follett, Elton Mayo and Chester Barnard treated administration as scientific management. In scientific administration "emphasis was on organizational structure and the formal relationship of personnel to obtain efficiency in operation." Kefauver adds :

Scientific administration is not objectionable when it represents an effort to secure meaningful and valid data bearing on administrative problems if the data are not given exaggerated importance and if other important factors for which data can be obtained are not ignored.⁴

Ananda W.P. Guruge is of the opinion that the application of modern management techniques to educational administration is not without difficulties. One of the difficulties is that modern management techniques cannot be applied to education alone, education being part of public administration.⁵

He further points out that "there is no relationship between the educational administrators and leaders in business and industry regarding the products of the educational system."⁶ But on the other hand, Prof. J.N. Kapoor made it clear that by highlighting the differences between industry and education in respect of operation-research, he was only trying to stress the application of operation-research in the formulation of new concepts.⁷ "Organization is an activity, rather than a management technique. It cannot be forced on the educational set-up."

Here one should keep in mind that the function of management is not to formulate but to implement policies. Though scientific administration is not always a very sound type of administration in education, yet it can serve some valuable purposes. Sears adopted five major elements of educational administration :

³Russell T. Gragg. Article on administration in *Encyclopaedia of Educational Research* (Ed.) Chester W. Harris. New York : Macmillan 1960, p.19

⁴Grayson N. Kefauver. Re-orientation of educational administration, the 55th year book of the National Society for the study of Education (Part II) *Changing concepts of Educational Administration*, Edited by Nelson B. Henry. Chicago : The University of Chicago Press, 1946

⁵Asian Institute of Educational Planning & Administration, *Modern Management in Educational Administration*, New Delhi : AIEPA, 1971, p. 21

⁶*Ibid*

⁷*Ibid*

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- i) Planning
- ii) Organization
- iii) Directing (or commanding)
- iv) Coordination, and
- v) Control

Frederick Taylor was of the opinion that planning and implementation should be separated. If they are mixed up, the quality of the work will deteriorate. Planning should be based on time-study and other data related to production, which are scientifically determined and systematically classified. It should be facilitated by standardizing tools, instruments and methods. Management should be taken over from the workers. Great emphasis was laid on coordination. Henri Fayol also laid emphasis on scientific management. The former worked with workers, the latter with managers. Both ignored the individuals.

Mary Parker Follett tried her best to bring about a better society. She believed that to reach a common goal understanding was essential. Educational administration is concerned with the management of things such as money, buildings, grounds, laboratories, equipments as well as relations between children, parents and teachers, and coordination between boards of education, local, state and national-level agencies.

Educationists and educational administrators had ignored human relations. But Elton Mayo firmly expressed his view that relations were the sum total of administration.

Chester Barnard suggested that effectiveness was system-oriented and was related with the achievement of the organizational goal, while efficiency was person-oriented and was related to the feeling of satisfaction a worker derives from membership of an organization. Common goals cannot be achieved unless the individual is satisfied within the group.

K.S. Basu points out that "in regard to delegation of authority, it must be clearly understood that it does not mean abdication of function. Delegation does not mean reduction in accountability. The authority making the delegation still remains accountable for the performance."⁸ Though there are no reliable objective measures, as such, to assess the degree of external and internal consistencies of an organization, some inferences in regard to these could certainly be drawn from a variety of indicators. Should administration of education include or preclude path-setting and policy-making? That is, should or should not the administration decide about the organizational aims and objectives? If it should not, should it take all the decisions about implementation of given aims and objectives? If the

Ibid.

administration decides about the aims and objectives, will such decisions work in practice? Will they be acceptable to people in general? These questions can hardly be answered unequivocally or in a culture-free perspective. Answers depend *inter-alia* on the theory of the functions of the state to which a society subscribes.

In a democracy, it is the legislature which decides the fundamental objectives of the organizations under state control and does not interfere much with functioning or the objectives of private organizations. It can be included that even in a democratic society, educational administration, in public or private organizations, is not in practice synonymous with management.

"The inevitable consequence of this," writes R.C. Sharma, is that an educational administration operates within the framework of vaguely-stated and often unstated educational objectives and policies. This makes his task very difficult. Indeed, he has, as a first step towards helping the achievement of the objectives of his enterprise, to interpret them. The question then is: Can he state his interpretations by putting them in writing for facilitating communication between him and his clients and subordinates? Can he do this without being controverted by these persons? Is it really possible for the Director of Education (or the Director of Public Instruction, as the case may be) and the parents to see educational objectives and their priorities from the same angle? To avoid these controversies, will a career-seeking administrator—and all of us are to some degree or other careerists—not leave the educational objectives and policies unstated? This is in fact what happens in practice. Educational objectives are left usually unstated.⁹

Is knowledge of the subject-matter, that is, the substantive problems of the organization, the crux of administration? If that is so, administration must limit itself to solving substantive problems. Since the problems can only be solved by an educationist in a particular educational organization, it follows that administrators cannot be transferred from one organization to another without risking organizational efficiency. In other words, an administrator familiar with a particular type of administration should not be given charge of a different set-up unless he acquires a thorough knowledge of the organization to which he wants to switch over.

Only a person trained in a profession can be a good administrator. An IAS/ICS cannot be an effective DPI/DE. Since an IAS/ICS is a specialist in administrative processes, he can be a good educational administrator if he receives professional training. A good educational administrator is one who

⁹R.C. Sharma: Meaning and Substance of Educational Administration, *Educational Trends*, Regional College of Education, Ajmer, Vol. II No. III-IV, March 1968, p. 17

has knowledge of the substantive problems of education and at the same time is an expert in the processes of administration.

Besides this, a school of thought considers the administrative process as one common to all types of administration. One who is an expert in the process can administer any organization. But this view does not hold good in all situations.

These days the concept of POSDCORB initiated by Gulick (planning, organization, staffing, direction, coordination, or controlling, reporting and budgeting) is gaining popularity. Most of the techniques and methods of planning in education are different from those in a factory. For example, planning principal has to pay attention to the suggestions of teachers and the students as well. The head of the school has to make the process of planning participatory and cooperative, which is certainly not what is done in a manufacturing firm. Attention may be paid to the methods and techniques of planning pertaining to the allocation of resources, knowledge of subject-matter, formulation of objectives and the like. In the same way, in an organization, for grouping the work into operating units, knowledge of the subject-matter is no less necessary than the techniques of departmentation. This is however not true for professional education. "Apart from these considerations, decisions about the chain of command, the line and staff relations, work allocation within a school, time-tables and instruction of students cannot be made effective by an administrator who does not have a good background in education. A similar conclusion seems to follow the analysis of the other functions of the administrative process, specially the one relating to controlling and evaluating the educational enterprise."¹⁰ This conclusion supports the view that educational administration is a process and is a means of solving the substantive problems as well.

One more debatable point is : Is administration purely a science ? or is it an art ? or is it both ? or is it an art and an applied science ? The controversy is not a new one. Nothing can be said on either side conclusively. It is very difficult for an administrator to take a decision on the basis of known variables eliminating completely all the administrative factors. Mukherji says, "Like any other branch, this new field of knowledge is more an art than a science." He adds, "It is indeed true that an educational administrator bases his activities on a body of basic principles which have been arrived at inductively from the study of human experience of organization."¹¹ Efforts are being made to develop administration into an applied social science.

¹⁰Ibid

¹¹S. N. Mukherji : *Secondary School Administration*, Baroda : Acharya Book Depot, 2nd edition, 1963, p. 4

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Today the scope of educational administration is considerably wider than it was before. Pupil's selection, admission, preparation of the school budget, framing of the curriculum, supply of textbooks, organization of co-curricular activities, evaluation procedure, inservice training, and ancillary services like bus service, health services, cooperative stores, etc., all included in educational administration. All administrators are not competent to supervise subjects such as science, mathematics and music, with the result that there is no one to guide teachers in these subjects. In order to rectify this drawback, panel inspection or supervision may be introduced. The panel may include some senior teachers and the inspector of schools (or district education officer). The teachers in the panel should be specialists in different subjects.

The Secondary Education Commission opines : "For special subjects like physical education, domestic science, art, music, etc. these should be attached to the Director's office, certain experts in these subjects who will inspect the different schools periodically and help in improving the standard of teaching."¹²

The Education Commission (1964-66) emphasized that the District Education Officer and his staff should "concentrate on supervision proper, that is, on improvement of instruction, guidance to teachers, organization of their inservice programmes and provision of extension services to schools."¹³

Does financial help mean administrative control ? Should the head of an educational institution and his colleagues be deprived of the exercise their judgment simply because they are receiving financial aid from the government? "Administration does not and should not mean domination..It should only mean guidance, counselling and participation through actual aids and activities. Unfortunately in India, the aided schools are under the permanent obligation of the government because they receive financial assistance by way of annual grants. The initiative on the part of the school-organizations is killed to such an extent that they have developed the habit of waiting for orders from above. Democracy demands freedom and certainly so in educational matters."¹⁴ Thus the internal administration of the school should be left to the school authorities. Curriculum—framing, prescribing textbooks and evaluation procedures should be the direct responsibility of the

¹²Report of the Secondary Education Commission (1952-53), Ministry of Education, Government of India, The Publication Division, 6th reprint, June 1965, p. 149

¹³Report of the Education Commission (1964-66), Ministry of Education, Government of India, The Publication Division, 1st edition, 1966, p. 668

¹⁴S.N. Mukerji (Ed.) *Administration of Education in India*, Baroda, Acharya Book Depot, 1st Edition, 1962, p. 227

actual workers in the school. The sole aim of educational administration, after all, is the all-round development of the learner. Unfortunately, educational administration today, instead of being 'child-centred', is becoming 'file-centred'.

CONCLUSION

The Education Commission (1964-66) was of the opinion that "there should be a change in the attitudes of administrators who should cultivate an openness of mind and a spirit of enquiry rather than a rule-of-the-thumb approach which tries to stick to the established practices even when they cease to be meaningful."¹⁵

Students of educational administration should note the differences between educational administration and educational management. Educational administration can perhaps be defined as a process and an agency which is responsible not only for the solution of substantive problems but also for the interpretation and effective achievement of the aims and objectives of an educational organization. Educational administration has to perform functions such as interpreting and delineating the aims and objectives of education, laying down the organizational structure for the accomplishment of these objectives, directing the formulation and implementation of the educational programmes, ensuring the provision of physical and human resources required for achieving the objectives, framing and implementing personnel policies, and helping to foster school-community relations. □

¹⁵Report of the Education Commission (1964-66). Ministry of Education, Government of India, The Publications Division, 1st Edition, 1966, p. 671

Wastage in Primary Schools : A Psychological Study*

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The paper reports on a preliminary investigation into the psychological aspects of wastage at the primary level of education caused by frequent dropping out. Information for a sample study was collected on the basis of a structured interview schedule by a census type door-to-door investigation. Twenty-six areas of psychological factors were considered for the study. Non-parametric analyses of the data indicated that almost all the factors considered were significantly related to the problem directly or indirectly, either as a cause or as an effect.

The areas considered were: 1) The child's awareness of the limitations of the environment; 2) Peer influence; 3) Engagement of the children; 4) Desire for learning; 5) Cultural status of the family; 6) Interest pattern; 7) Attitude; 8) Affective relationship with school and teachers; 9) Sibling pattern; 10) Goal frustration due to stagnation; 11) Habit pattern; 12) Punishment; 13) Aspirations and expectations; 14) Examination consciousness; 15) Affective relationship at home; 16) Sense of confinement; 17) Parents' assessment of the ability of their children; 18) Restlessness; 19) Attentive condition; 20) Speech defect; 21) Language fluency; 22) General ability; 23) Trend of social and personality development; 24) Sensory defect; 25) Physical deformity, and 26) Level of comprehension.

It has been suggested that wastage in this form can only be checked by identifying the potential dropouts well ahead, so that special curricular and other necessary measures may be taken. Better understanding of the psychological nature of dropouts has been stressed.

* This is a part of a study directed by Dr. R. Kundu, Reader in Psychology, Calcutta University, and Prof. P. C. Choudhuri, Vice-Principal-in-Charge, State Institute of

ILLITERACY is a colossal national wastage and barrier to national development. On the International Day of Literacy Campaign, it was declared by the Director General, UNESCO that there were 800 million illiterates in the world, i.e. a third of the world population was illiterate. India's contribution to the figure is, of course, substantial.

In spite of the rapid expansion of educational facilities, there has been no significant narrowing of the gap between goal and achievement. The population explosion, huge wastage at the primary level and indiscriminate and disproportionate expansion of facilities, are among the factors that have checked the spread of literacy.

The report of the Provincial Board of Primary Education, Bombay (1941) asserted that "anyone who drops out or is withdrawn from school before spending sufficient time (at least 120 days) in grade IV or V or before actually passing it, constitutes a case of wastage". All the investigators in this area are agreed on this (Gadgil and Dandekar 1955; Directorate of Education, Bombay 1960; Chickermane 1962; Choudhury 1965). But unfortunately, apart from the masses of unschooled children, the dropout phenomenon causes a huge wastage. Many reports have presented a distressing picture of educational wastage in our country (*Education in India* 1963-64; Saraf 1973).

Studies have been undertaken from time to time to find out the causes of wastage in the form of dropouts. Socio-economic and pedagogical factors have been blamed. Rege (1971) summarized the causes and classified them into three categories: socio-economic, educational and miscellaneous. Sharma and Sapra (1969) examined eight causes of wastage related to the pupils, six significant causes related to schools and 14 causes related to home.

It seems that the causes of wastage can be classified from a different angle. Detailed accounts of the areas taken into consideration by the earlier researchers assert that many of the causes are psychological. It was, therefore, decided to approach the problem from the psychological point of view and as a preliminary investigation, this pilot study on a small sample was undertaken. The purpose was not only to find out the causes but also to explore the psychological nature of the dropouts.

METHOD AND HYPOTHESES

The design of the study was one-sample, that is no parallel group of Education, West Bengal. Prof. Choudhuri supported the project with the resources of the State Institute of Education. The junior author was also associated with the project.

those who continued study was considered. Hypotheses were based on the probability or expectation of the occurrence of certain phenomena within the group taken into consideration and have been enunciated below.

- 1) A child who is highly conscious of the limitations of his environment is susceptible to pessimism or frustration, which may prompt him to drop out. Therefore, dropping out may be very frequent among those who are aware of their financial and other limitations.
- 2) Peer influence may have a significant role in causing dropouts and also in providing motivation for attending school.
- 3) Excessive involvement of students in domestic or other forms of work may lead them to drop out.
- 4) Villages or slum dwellers may be more inclined towards grooming their children in a trade. Children from families with a 'family trade' (cobblers, potters, etc.) are likely to discontinue study.
- 5) Low cultural status may be responsible for the lack of motivation to improve one's cultural condition and that of the family. The frequency of dropping out may show inverse variation with the education of the parents.
- 6) Lack of interest in study on the part of parents as well as their children and conversely their interest in something other than study, may be a cause for dropping out.
- 7) An unfavourable attitude towards the school, teachers, and education as a whole, of the guardians and the children, may be a common feature among dropouts.
- 8) The level of aspiration may be low among the dropouts and their guardians.
- 9) Children born earlier to the parents may drop out more frequently than children born later. Male and female children from male and female-dominated sibling patterns respectively are more likely to drop out.
- 10) In each case of dropouts it is likely that an affective relationship was not established between the school and the pupils.
- 11) Level of academic achievement among dropouts is likely to be low.
- 12) Dropouts are likely to be more examination-conscious.
- 13) Dropouts are likely to be punished at school more than at home.
- 14) An unusual affective relationship between the child and the parents may cause frequent dropping out.
- 15) Dropouts might suffer from a sense of confinement in the school which may lead them to leave school.
- 16) It is likely that the habit of preparing lessons regularly is not so strong among dropouts.

- 17) The parents of dropouts are not likely to be aware of the day-to-day curricular progress of their children.
- 18) General health conditions may be low among dropouts.
- 19) Speech and sensory defects, restlessness, arrested sociability, physical deformity, low level of comprehension, inattentiveness, etc., may be low among dropouts.

An interview schedule consisting of 120 items covering all these hypothetical causes and also some community information was prepared. One hundred and two dropouts within the age range 6-11 years and their guardians were interviewed individually. The study was mainly confined to dropouts from primary school.

The following statistical methods were used for testing the hypotheses.

- 1) When there were two categories of response, the binomial test was applied (Seigel, 1969).
- 2) When there were more than two categories of response, the one-sample Chi-square test was applied (Seigel, 1969).
- 3) When the responses in two or more different items were compared, the K-independent sample Chi-square test was applied.
- 4) In order to compute the expected mean number of examinations in which the dropouts appeared, the following formula was derived by Kundu and Chakrabarti.

$$E = \frac{\sum_{c=1}^{c=j} (2C-1) f_j}{N}$$

Where E = expected mean number of examinations; c_j = class from which f individuals dropped out; N = total number of dropouts.

The basic assumptions for the formula were that 1) each of the schools held two examinations each year and 2) a dropout appeared in only one examination in the grade at which he/she discontinued study.

RESULTS

Results of the test (of the aforementioned hypotheses) are given below in brief.

- 1) Dropouts were found to be highly aware of the financial and various other limitations of their environment ($\chi^2=109.44, .001 > p, df.=8$).
- 2) Peer influence was found to have no role in the causation of

dropouts ($\chi^2=34.68$, $.001 > p$, $df.=3$). But it was found to be highly significant in motivating the children to go to school ($z>3.7$, $.00011 > p$).

3) Most of the dropouts were engaged in domestic work ($\chi^2=103.53$, $.001 > p$, $df.=4$), in non-earning occupations rather than earning ones ($z>3.7$, $.00011 > p$).

4) Most of the dropouts did not have training in any skill ($z>3.7$, $.00011 > p$). They were highly inclined to take training in handicrafts ($z=2.67$, $.0038 \approx p$). They were also inclined to go through formal schooling ($z>3.7$, $.00011 > p$). Their inclination to undergo formal schooling was stronger than that for training in any skill [$\chi^2=19.59$, $.001 > p$, $df.=2$ (2-1)]. The authors observe that convention played a significant role in these expressed inclinations.

5) Cultural status was invariably low. Better cultural environment was not available within the community ($z>3.7$, $.00011 > p$) and within the family ($z>3.7$, $.00011 > p$). Most of the guardians were illiterate ($\chi^2=90.00$, $.001 > p$, $df.=3$).

6) Most of the respondents were interested in handicrafts ($\chi^2=84.00$, $.001 > p$, $df.=5$). Reading interests among the guardians and among the dropouts were almost absent ($z>3.7$, $.00011 > p$). Leisure-time interests were mostly in productive activities yielding supplementary income ($\chi^2=63.71$, $.001 > p$, $df.=6$). Supplementary income was given more importance than pleasure ($z>3.7$, $.00011 > p$). Parents observe their children to be interested in study ($\chi^2=53.50$, $.001 > p$, $df.=3$). This observation of the parents runs contrary to the respondents' interest. School was preferred to home ($z>3.7$, $.00011 > p$). Home was also associated with punishment.

7) Guardians as well as the dropouts expressed a favourable attitude towards education, school and teachers; in all cases ($z>3.7$, $.00011 > p$).

8) The guardians' immediate expectation was that their children would take up a handicraft ($\chi^2=110.55$, $.001 > p$, $df.=8$). Future aspirations were confused and there was no conformity between immediate and future expectations. Children's expectations and aspirations were mostly confused as well. ($\chi^2=5.44$, $.30 > p > .20$, $df.=5$). There was no conformity between children's aspirations and parents' expectations.

9) First and second-born children tend to drop out most frequently ($\chi^2=58.73$, $.001 > p$, $df.=7$). More dropouts came from the brother-dominated and sister-dominated families than from extreme or balanced families.*

*A brother-dominated family is one in which the number of brothers exceeds that of sisters. A sister-dominated family is one in which the number of sisters exceeds that of brothers. An extreme family is one in which there are only male or female children. In a balanced family the number of brothers equals that of sisters.

($\lambda^2=16.80$, $.01 > p > .001$, $df.=4$). There was no indication that sister-dominated families contributed more girl dropouts than boys and vice versa [$\lambda^2=8.73$, $.20 > p > .10$, $df.=5$ (2-1)].

10) No effective relationship of the children with the school or the teacher could be traced ($z > 3.7$, $.00011 > p$).

11) Level of achievement was reported to be average by most of the dropouts and their guardians. ($\lambda^2=51.36$, $.001 > p$, $df.=2$). This does not appear sound to the authors. Indirect assessment from the comparison of the expected and observed means of the frequency of examinations in which the dropouts happened to appear while they were in school, indicates more possibility of stagnation and goal frustration. Further study is necessary in this area.

12) Examination consciousness is likely to be positive ($z=1.02$, $.1539 \geq p$).

13) Punishment as a system of maintaining discipline was found to be a regular feature in most of the schools ($z=3.64$, $.00016 \geq p$). Most of the dropouts were being punished at school regularly ($z=2.52$, $.0059 \geq p$). Punishment was occasional at home ($\lambda^2=12.71$, $.01 > p > .001$, $df.=2$). Dropouts tend to be punished at school more than at home [$\lambda^2=12.71$, $.01 > p > .001$, $df.=3$ (2-1)]. Male respondents were being punished at home more by the male authorities than by the females. The reverse happened to be true for girls.

14) Parents were the love objects for most of the dropouts ($\lambda^2=147.67$, $.001 > p$, $df.=6$) and most of the dropouts were loved more by the mother than by the father ($z=1.53$, $.063 \geq p$). The love pattern was reciprocal [$\lambda^2=6.10$, $.70 > p > .60$, $df.=8$ (2-1)]. No sex bias could be detected with respect to the object of love and the child concerned [$\lambda^2=1.33$, $.70 > p > .60$, $df.=2$ (2-1)] and [$\lambda^2=.67$, $.70 > p > .60$, $df.=2$ (2-1)].

15) No difference could be observed between those who expressed a sense of confinement during schooling and those who did not ($z=.47$, $.3192 \geq p$).

16) The habit of preparing lessons regularly could not be divided into positive and negative categories ($z=.28$, $.3879 \geq p$). Evening was the favoured reading time ($\lambda^2=22.95$, $.001 > p$, $df.=2$). Reading habits among the guardians were almost absent ($z > 3.7$, $.00011 > p$). Drinking habits were reported in a few cases.

17) Parents were mostly careless about assessment of the abilities and achievements of their children ($\lambda^2=24.09$, $.001 > p$, $df.=3$).

18) The general health standard was average in most cases ($\lambda^2=32.90$, $.001 > p$, $df.=2$).

19) Speech defects were noted in 28.43 per cent cases, sensory defect in 7.84 per cent cases, restlessness in 19.61 per cent cases and arrested social

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bility, shyness, fearsomeness, etc. in 98 per cent cases. Physical deformities were noted in a few cases. Level of comprehension, in general, was low. Delayed reactions were noted in 57.06 per cent cases. Inattentiveness was noted in 28.43 per cent cases. Language ability was found to be low in general.

DISCUSSION

Many of the findings of this investigations are in agreement with the results obtained by earlier investigators. But from the detailed analyses of the data it appears to the authors that though some common features can be identified easily (as the results supported many of the hypotheses and only a few were rejected), each of the dropout cases is aetiologically unique like clinical syndromes. Therefore, more elaborate psychological studies are called for in order to have a better understanding of the problem.

CONCLUSION

It is recommended to educational administrators that they prepare a catalogue of symptoms displayed by dropouts which would help identify potential dropouts well ahead of their leaving school. Dropping out can be effectively checked by preventive measures adopted at the right time. Adoption of a simplified, condensed and work-incentive oriented curriculum, the non-formal system of education, a sympathetic attitude on the part of teachers and a deeper understanding of the psychological dimension of the problem—all these are necessary to check this huge wastage.

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Development of an Inventory to Detect the Level of Grade consciousness of Home Science Students

BEDAMINI DEVI

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THE UNDUE EMPHASIS given to examinations in our current educational system and its ill-effects have been pointed out and analyzed by education commissions, examination committees and individual observers. Ullah¹ reported the observations of the International Commission on Examination in the following words:

Examinations tend to create an attitude of tension and anxiety among pupils, with the result that they lose their natural curiosity and endeavour for real learning... [examinations] demoralize teachers who are led to think that their reputation largely depends on the examination successes of their students.

Benjamin S. Bloom concluded, from his informal talks with students from six different Indian universities that the existing examination system had created a powerful effect on all the students and teachers who had come in contact with it. It has reduced learning to part-time activity,

¹Salamat Ullah, *Examinations in India, Their Defects and Remedies*, Orient Longmans, 1951, 16-17

²*Evaluation in Higher Education*, University Grants Commission, New Delhi, 1961, pp. 11-14

teaching to the coverage of particular material and education to a relatively drab and meaningless activity³. The report of the Committee on Examinations³ states that many students strongly feel that to get more marks, by any means, fair or foul, is far important than anything else. Parents and teachers are also concerned only with examination marks and not with the means by which the marks are obtained. This accounts for irregular attendance, indifference to the value of scholarship and complete loss of love for learning.

Literature on examinations in India contains suggestions for reforming the existing system. The idea behind all the reform measures suggested is that the students be more learning-conscious than grade-conscious or marks-conscious. How do we know how much grade-conscious the students are at a particular time in a particular system of education? The current study is a beginning in this direction in that some efforts are made to develop an inventory to detect the level of grade-consciousness of home science college students who were enrolled in a grade-credit system of education.

Objectives

Major Objectives : To develop an inventory to detect the level of grade-consciousness of college-going home science students.

Specific Objectives : 1). To develop an inventory to detect the level of grade-consciousness of the home science students, and 2). to determine the reliability of the developed inventory on a grade-consciousness.

Method

The design of the study included the following steps :

- a) Construction of items on grade-consciousness
- b) Selection of items on grade-consciousness
- c) Pretesting the items
- d) Finalizing the items
- e) Administering the inventory to the students
- f) Scoring the items
- g) Finding the item discrimination through item analysis
- h) Selection of items which are found to be discriminative after item analysis.
- i) Determinining the reliablitty coefficient of the inventory by correlating the scores obtained by students using the split-half method

³Report of the Commission on Examinations, Central Advisory Board of Education, Ministry of Education and Social Welfare, NCERT, 1971, pp. 13-14

Population and Sample

The population comprised 701 home science college students from B.Sc. first year to M.Sc. final who were studying in the Faculty of Home Science, Maharaja Sayaji Rao University, Baroda, when the investigation was conducted (academic year of 1971-72). Fifty per cent sample was drawn from the undergraduates using the random sampling procedure and a census was taken for the M.Sc. students. The sample consisted of 246 undergraduates (stratified by year and grade) and 50 postgraduate students (stratified by year) out of which 224 undergraduates and 47 postgraduate students responded. There were 68, 56, 45, 55, 27 and 20 students from B.Sc. first year to M.Sc. final respectively.

Tool

An inventory to detect the level of grade-consciousness was developed by the investigators by gathering information from reference books, journals and research reports relevant to the study. Informal conversation with the students, their remarks regarding grades within and outside the classroom and the personal experience of the investigators also yielded information.

The inventory developed had items on three elements of consciousness—cognition, affection and conation. The three categories are based on the theoretical construct derived from the review of literature available. Ray¹ defines 'consciousness' as the "awareness of events within one's self". He accepts the use of 'experience' and 'consciousness' synonymously. According to him consciousness is private. The person who goes through an experience is the sole witness to the event. Other people cannot share the experience : they can only hear it reported. Edgell² reports that experiences cannot be expressed in less than three proportion : "I feel somehow", "I know something", "I do something", they are termed feeling, cognition and conation.

Feeling denotes the experiences being affected pleasantly or unpleasantly by an object. It is a passive and subjective state of consciousness in the sense that it refers to the condition of the feeling subject than the condition of the object of feeling.

Cognition is a process by which the self interprets or understands its objects by assimilating and integrating its own sensations and ideas. It includes various processes—perception, memory, imagination, conception, judgment and reasoning.

¹William S. Ray, *The Science of Psychology*, New York, Macmillan, 1964, p. 8

²Beatrice Edgell, *Mental Life*, London, Methuen, 1926, pp. 12-18

Conation includes all forms of striving and endeavour. It is an experience of being mentally active, pressing forward from the pleasant experience towards or away from some coming moment.

In the present study an attempt has been made to detect the level of consciousness of an object, 'letter grade', by describing situations representing the three theoretical elements of consciousness and asking students to record their reactions to each of the situations described. And thus the behaviour of the students in these situations, as expressed by themselves, are interpreted in terms of the level of 'consciousness' regarding grades or grade-consciousness.

The inventory developed had a total of 76 items with 22 items in the category of cognition, 28 items in the category of affection and 26 items in the category of conation. The 76-item inventory was given to a group of five judges—two psychologists, two educators and one educator—psychologist—who had a minimum of ten years of teaching experience in their respective fields and who were familiar with the grade-credit system. They were requested to check the items with reference to *i)* whether the items were based on the theoretical framework of consciousness ('yes or no') *ii)* to what extent ('G' to a great extent, 'S' to some extent, and 'N' not at all) each of the items would elicit grade-consciousness; and *iii)* whether the items categorized under each of three elements of consciousness belonged to the category to which they were included.

The items in the inventory were selected and ranked on the basis of the following criteria:

Step I: The 70 items which were checked 'yes' by five or four judges were selected.

Step II: The 70 'yes' items were further judged by finding out the frequencies of the judges who had checked 'G' (great extent), 'S' (some extent), and 'N' (not at all) for those items. These items were ranked in descending order.

A five-point rating scale 'A.A.' (almost always), 'O' (often), 'S' (sometimes), 'V.R.' (very rarely) and 'N' (never) was incorporated in the inventory after consulting and getting the approval of the judges.

Pretesting

The 70-item inventory was then presented to 16 students representing all the years. They were asked to check one of the five possible responses for each of the items. The pretest data were analyzed by counting the frequencies of respondents for each item on the five-point rating scale. The frequencies in the first three points on the scale were summed up and likewise

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the frequencies in the last two points of the scale were totalled. Forty-one items were selected, based on the frequencies of responses 'A.A.', 'O', and 'S' together on the one hand and 'V.R' and 'N' together on the other, the ratio being 11:5; 10:6; 9:7; 8:8; 7:9; 6:10; and 5:11. Some of the items which ranked high according to the opinions of the judges did not serve the purpose when checked by the students and vice-versa. The final 41 items included, the judges decided, would reveal the grade-consciousness of the subjects.

Collection of Data

The data were collected between January 26 and March 18, 1972. The test was administered to the students personally by the investigators. The purpose of the study and the instructions for responding to the questions were explained.

Scoring

The student responses on each of the items of the inventory was scored with a pre-determined key. The five possible answers of the rating scale, 'A.A.', 'O', 'S', 'V.R' and 'N' carried 4, 3, 2, 1, 0 scores respectively. The possible range of scores was 0 to 164.

Selection of Items for the Final Inventory

Items for the final inventory were selected by finding out the total scores of the respondents on the 41 items administered to them and selecting two criterion groups for each year—'high grade-consciousness scorers group' (one-third of the respondents with the highest total scores) and 'low grade-consciousness scorers group' (one-third of the respondents with the lowest total scores) and evaluating each of the 41 items in terms of the significant differences between the scores of the two groups. The formula used was:

$$t = \frac{\bar{x}_H - \bar{x}_L}{\sqrt{\frac{\sum (x_H - \bar{x}_H)^2 + \sum (x_L - \bar{x}_L)^2}{n(n-1)}}$$

Where \bar{x}_H = the mean score on a given item for the high scorers group

\bar{x}_L = the mean score on the same item for the low scorers group

In Table 1 are presented the 't' values of the mean differences between the 'high grade-consciousness scorers group' and 'low grade-consciousness

scorers group' according to year in college, first year B.Sc. to M.Sc. final, and each of the 41 items on the grade-consciousness inventory.

Items were selected for each year by comparing the obtained value of 't' and given 't' value at $\alpha/2.025$ level of significance.

TABLE 1

't' VALUES OF THE MEAN DIFFERENCES BETWEEN 'HIGH GRADE' CONSCIOUSNESS SCORERS GROUP' AND 'LOW GRADE-CONSCIOUSNESS SCORERS GROUP' ACCORDING TO YEAR IN COLLEGE AND EACH ITEM ON THE INVENTORY

Serial Number of Items	First year B.Sc.	Second year B.Sc.	Third year B.Sc.	Fourth year B.Sc.	Junior M.Sc.	Senior M.Sc.
1+	0.72	3.30**	1.78	2.74**	2.46*	3.44**
2+	3.28**	3.09**	1.88	2.73**	2.67*	2.36*
3	2.04*	4.08**	4.11**	3.04**	2.23*	1.56
4	2.88**	1.42	2.17*	2.27*	2.31*	-0.90
5	2.17*	2.75**	2.54*	2.05*	1.61	1.62
6	0	2.05*	-0.45	3.39**	1.86	-0.45
7	1.67	3.31**	1.74	2.56*	1.76	2.01
8	1.33	1.08	3.31**	2.09*	2.87*	2.11
9+	2.78**	1.64	2.56*	3.55**	2.40*	2.35*
10	1.33	1.30	2.34*	2.72*	1.15	3.83**
11	2.99**	4.48**	1.87	3.12**	4.67**	1.18
12	3.84**	5.36**	1.60	3.80**	2.36*	1.07
13+	1.25	2.82**	2.83**	6.86**	7.01**	4.18**
14+	3.57**	1.98	1.68	6.76**	2.39*	3.13**
15+	2.26*	2.29*	1.33	4.89**	4.26**	3.18**
16	4.42**	1.96	1.62	4.39**	3.35**	0.29
17+	3.41**	1.74	3.83**	4.81**	5.15**	3.27**
18+	1.16	2.52*	2.70*	4.45**	4.96**	7.55**
19+	2.06*	2.85**	0.54	3.18**	4.20**	2.91*
20+	2.84**	1.60	2.71*	2.89**	3.78**	6.93**
21+	6.64**	0.82	2.96**	3.78**	2.77*	2.66*
22	2.93**	3.07**	2.53*	1.87	2.10	2.43*
23+	3.74**	3.28**	2.80**	3.91**	3.58**	2.71*
24	1.86	2.21*	1.63	4.66**	3.54**	1.45
25+	3.14**	3.78**	4.25**	2.89**	4.05**	3.61**
26	4.30**	2.85**	4.13**	3.06**	2.14*	0.
27	2.05**	1.26	2.03	4.25**	2.86*	1.92
28+	2.61*	1.49	1.60	2.34*	2.37*	2.66*
29	1.80	0.53	3.97**	3.15**	2.31*	1.79
30+	7.55**	2.27*	3.41**	5.25**	5.27**	5.88**
31+	4.40**	2.63*	2.30*	3.39**	3.30**	2.50**
32	3.84**	1.29	1.30	3.13**	3.34**	1.06

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				4.66**	1.60	1.65
			4.12**	3.10**	2.57*	1.08
33	3.20**	3.75**	3.07**	2.60*	4.31**	4.36**
34	4.09**	2.51*	1.77	2.92**	6.22**	3.56**
35+	2.04*	3.98**	2.91**	1.57	3.40**	0.42
36+	1.25	2.66*	1.31	2.28*	4.54**	5.33**
37	-1.03	2.08*	4.90**	3.29**	1.57	2.05
38+	2.89**	2.71*	2.02	2.60*	4.08**	1.96
39	3.31**	2.41*	2.98**	2.00	2.26*	1.21
40	2.49*	2.79**	1.47			
41	2.17*	4.49**				
	$N_H, NL = 23$	$N_H, NL = 19$	$N_H, NL = 15$	$N_H, NL = 18$	$N_H, NL = 9$	$N_H, NL = 7$
P .025 $t_{\alpha/2} = (\pm 2.02)$		(± 2.03)	(+2.05)	(+2.03)	(+2.12)	(+2.18)
P .005 $t_{\alpha/2} = (\pm 2.69)$		(± 2.72)	(+2.76)	(+2.73)	(+2.92)	(+3.06)

N_H = High grade-consciousness scorers group.
 N_L = Low grade-consciousness scorers group.

* Significant at or beyond $\alpha/2$.025 level.

** Significant at or beyond $\alpha/2$.005 level.

— Significant items which were found to be common in first, second and third year undergraduate home science students.

+ Significant items which were found to be common in fourth year undergraduate and junior and senior M.Sc. home science students.

= Significant items which were found to be common in all the six years.

RESULTS

The number of items with 't' value significant at the level of significance considered, varied from year to year with a minimum of 21 and a maximum of 38 items. The items showing the significant 't' value for the first, second, third and fourth-year undergraduates, and junior and senior M.Sc. students were found to be 30, 28, 23, 38, 34 and 21 respectively. Only five items were found to be common when all the six years were compared. Students in each of the six years, it was found, tended to respond to different sets of items, thereby raising a major problem in the way of developing a common inventory for all the six years. When the pattern of response set in terms of the items showing significant 't' values was analyzed for the first, second and third-year students, who were studying general home science courses, it was found that 12 items were common to all the three years. When this procedure was applied for the fourth-year B.Sc., Junior M.Sc. and Senior M.Sc. students, who were specializing in one of the five areas of specialization offered, 19 items were found to be common. Hence it was decided to have two inventories, one for the general group and the other for the specialization group.

Grade-consciousness Inventory for the General Group

- 1) I keep counting my grade-point average to find out the possibilities of getting an overall A or B or C.
- 2) It becomes difficult for me to concentrate on my studies in case of getting a low grade as I have to improve it and in case of getting a high grade as I have to maintain it.
- 3) When I have a difference of opinion with the teacher, I do not express it for fear of losing my grade.
- 4) I would like to have a pile of notes, assignments and term papers of A and B grade students of previous years so that I can save my time and energy and at the same time get a high grade.
- 5) When a teacher announces the marks obtained but not the range of marks which denotes the different letter grades, I get concerned as I am not sure what grade I would get.
- 6) When I cannot maintain an overall A or B or C because of one poor grade I think I should approach the teacher to eliminate the poorest grade.
- 7) I lose interest in some courses when I do not get the grade, I think, I deserve.
- 8) I wish the teacher were generous in grading.
- 9) I prefer tests in which factual information is asked as I know for sure that memorizing beforehand will fetch me high grades.
- 10) I want to get a pass grade whether I deserve it or not.
- 11) I would like to know what sort of questions a teacher would ask from the senior students as it may help me in selecting the likely questions and studying accordingly.
- 12) During the semester I study to get a C or a B or an A. But as soon as the semester is over I forget what I have studied.

Grade-consciousness Inventory for the Specialization Group

- 1) I cannot enjoy any social activity, like going for a movie or to a park because anxiety over what grade I might get in the test creeps into my mind most of the time, especially when I have taken a test or when I will be taking one soon.
- 2) In any test, as soon as I find the question paper somewhat difficult, I become nervous as I cannot help thinking about the possibility of my getting a fail grade or just a pass grade.
- 3) I am eager to know my grade because I think it is a shame to pass with a low grade.
- 4) Even though physically present it is difficult for me to concentrate on

my classwork in case I have a test just after the class or on the same day.

5) I become nervous in the test and cannot perform as well as I should if I find the question paper lengthy.

6) I prefer to present my report after witnessing how others do it. In case I have to do mine first I get concerned about the possibility of losing a high grade.

7) If my classmates were asked to grade I am eager to know what grade they have given to me as soon as I finish my report.

8) I am eager to know my test grade as I think it would help me determine how much I have to read for the next to make up for the grade, if necessary.

9) I prefer (like better) assignments to class tests as I know for sure that, taking my own time, I would be able to get better grades.

10) When a teacher does not mention anything regarding a test or assignment till the middle of the term, I get concerned as I am not sure on what basis she will grade me.

11) I am anxious to get a high grade as it gives me the feeling that I am clever.

12) I would like to have a pile of notes, assignment and term papers of A and B grade students of previous years so that I can save my time and energy and at the same time get high grades.

13) When a teacher announces the marks obtained but not the ranges of marks which denote the different letter grades, I get concerned as I am not sure what grade I would get.

14) Even when I do not know the right answer to a question in test I think I should fill in the space in order to get some marks by chance.

15) I lose interest in some courses when I do not get the grade I think I deserve.

16) I wish the teacher were generous in grading.

17) When a field-trip is arranged prior to a test I get concerned about the possibility of my getting a low grade in that.

18) Often while writing an assignment or a report or a term paper, I think about the grade I may get for it.

19) I would like to know what sort of questions a teacher would ask from the senior students as it may help me in selecting the likely questions and studying accordingly.

When items based on three elements of 'consciousness' for the final inventories were examined it was found that five items, two on affection and three on cognition, were common to both the inventories. The grade-consciousness inventory for the general group had three items in the category of cognition, three in the category of affection and six in cognition, while there were four,

twelve and three items in the categories of cognition, affection and conation respectively for the specialization group. This implies that the students in the specialization group tend to feel about grades rather than to think or act mentally.

The differences between the two final inventories in relation to common items seems to indicate that students from a particular group at a specified time tend to respond to certain items which may be characteristic of the group. Thus, other groups, if tested, may show different patterns of response. Therefore the inventory with 41 items which was administered to home science students of all the six years needs to be replicated a number of times with future students in order to find out about the stability of the response set for each year in college and also for developing a common inventory, if possible.

Determination of the Reliability Coefficient of the Grade-Consciousness Inventory

The reliability coefficient of the final inventory for each of the six years in college was determined independently by correlation of scores obtained by the students on the first half and second half of the inventory and then estimating it by applying the Spearman-Brown Prephcey formula. The inventory for the general group had 12 items and hence correlation of scores was based on the first six and second six items. For the specialization group, correlation of scores was based on the first ten and second nine items. The reliability coefficients for the total general group and total specialization group were also determined.

General Group

The reliability coefficients for the first, second and third years and the total group were .603, .624, .844 and .715 respectively showing a fairly high reliability. This implies that the internal consistency of the items is satisfactorily high. The inventory is reliable.

Specialization Group

The reliability coefficients for the inventory for fourth year B.Sc., junior M.Sc. and senior M.Sc. and the total group were .793, .927, .812 and .851 respectively. The reliability of the instrument is satisfactorily high. The inventory is reliable and hence the data collected by use of this inventory and the conclusions drawn from the data could be depended upon. ☐

A Psycho-social Study of Academic Underachievement*

SHANTA KUMARI AGARWAL

UNDERACHIEVEMENT is a grave problem from the economic and social points of view, because it involves wastage of human and economic resources. It is a problem from the learner's point of view also, as it causes emotional unrest and psychological tension. It causes distress not only to the underachieving students, but also to their parents and teachers. India cannot afford to waste the meagre economic resources available for school education. For the fullest utilization of these resources, it is essential that wastage in education be checked. There may be numerous factors responsible for the underachievement of students. This study was conducted to understand the phenomenon of underachievement of the secondary students of Rajasthan.

Objectives of the Study

- i) To identify the relationship that might be existing between personality and academic achievement.
- ii) To find out the relationship existing between the values of the students and their academic achievement.
- iii) To study the relationship between parents' values and academic achievement.

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- iv) To study the relationship between socio-economic status of the family and academic achievement.
- v) To study the influence of rural-urban factors on academic achievement.

Population and Sample

Population here refers to the boys of class XI from the State of Rajasthan. From this population a random sample of 41 schools, 20 urban and 21 rural, were selected. Further, one section of each of these schools was selected. Thus 1,408 students were included in the total sample. Out of this 819 students belonged to urban and 589 to rural areas.

Under and overachievers were identified on the basis of means of intelligence and composite scores of attainment tests. Students whose intelligence scores were above 54.5, but whose achievement scores were below 114, were considered to be underachievers, while those whose intelligence scores were below 54.5, but whose achievement scores were above 114, were considered to be overachievers. In all 180 underachievers (136 from urban and 44 from rural schools) and 220 overachievers (130 from urban and 90 from rural) could be identified.

Tools

- 1) Dr. S. Jalota's Verbal Group Test of general mental ability
- 2) Hindi version of Cattell's Jr. Sr. H.S.P.Q. by Kapoor and Mehrotra
- 3) *Meri Manyatayan*—students' values scale prepared by the researcher
- 4) *Mere Mata Pita Ki Eachoyan*—parents' values scale prepared by the researcher
- 5) Socio-economic Status Index
- 6) Dr. Bhatnagar's Attainment Tests in comp. Hindi, elementary mathematics, social studies and general science.

Method of Statistical Analysis

The purpose of the study was to investigate the relationship of psychosocial factors with under and overachievement. So each variable was studied for its significance as the factor related to academic under and overachievement. Further, analysis of results was split into two samples—urban and rural.

Significance was determined on the basis of the 't' test applied to the difference of the mean achievement scores of the under and overachievers.

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Thus C.R. for 14 personality factors, students' values, parents' values, and socio-economic status of the mean differences between under and over-achievement for the whole sample as well as for the urban and rural samples was calculated. Besides, C.R. values for the urban and rural underachievers and urban and rural overachievers were also worked out separately. Thus 20 sets of C.R. values were obtained.

RESULTS

I. Personality Factors of Under and Overachievement

A. The two groups have been found to be significantly different on the eight factors C,G,H,I,J,Q2,Q3 & Q4. On the remaining factors A,B,C,D,E, F & O they do not differ significantly. On factors C,G,H,Q2 & Q3 under-achievers have a lower mean score (8.73, 10.90, 9.86, 7.83 & 11.65 respectively) than the overachievers (10.12, 11.77, 10.63, 9.00 & 12.50 respectively), C.R. values being 4.96, 3.34, 2.65 4.50, & 3.69 respectively.

B. Urban-Rural Bias in Personality Factors of Under and Urban-achievement.

- i) The difference between urban underachievers and overachievers is significant at .01 level on factors C,G,J,Q2,Q3 & Q4. On factors C,G,Q2,Q3, urban underachievers have a lower mean score (8.82, 10.83, 7.99, 11.50) than urban overachievers (10.39, 11.93, 9.20, 12.82), their C.R. values are 4.24, 3.55, 3.90, 4.55 respectively. On factors J & Q4 urban underachievers have a higher mean score (8.46 & 6.81) than urban overachievers (7.49 & 5.78) and C.R. value being 3.46 & 3.14.
- ii) The Difference between rural underachievers and rural overachievers is significant on factors C,J,Q2 & Q4 and nearly significant on factor H. On factors C and Q2 rural underachievers have a lower mean score (8.46 & 7.32) than the rural overachievers (9.76 & 8.70). C.R. values are 2.32 & 2.70. On factors J & Q4 rural underachievers have a higher mean score (9.40, 9.04) than rural overachievers (7.62, 6.06), their C.R. scores are 3.78 & 6.93.
- iii) Urban and rural underachievers differ significantly on factors D,J, and Q4 and not on other factors. On factor D, rural underachievers have a lower mean score (7.40) than urban underachievers. (8.42) C.R. is 3.09. On factors J and Q4 rural underachievers have a higher mean score (9.40, 9.04) than rural overachievers (8.46, 6.91) C.R. scores are 2.84 & 5.91.

- iv) Urban and rural overachievers differ very significantly on factor O and significantly on factors A & Q3. On factor A the mean score of rural overachievers is higher (10.78) than urban overachievers (10.13), C.R. is 2.09. On factors O & Q3 rural overachievers have a lower mean score (5.73, 12.7) than urban overachievers (6.99, 12.82), their C.R. values being 3.50 & 2.50.

II. Students' Values as Factors of Under and Overachievement

A) The difference between underachievers and overachievers is highly significant on educational (C.R.=5.06), social (C.R.=2.73), and humanistic (C.R.=2.96) values. But on the remaining three values—materialistic, religious and personal, the two groups do not differ significantly. Overachievers have higher educational value. In regard to social and humanistic values the overachievers have a higher mean score (34.66 & 38.68) than the underachievers at 33.36 & 37.05 respectively.

B) Urban-Rural Bias in Students' Values of Under and Overachievement.

- i) Under and overachievement in the urban schools are also related to students' educational (C.R.=6.38), social (C.R.=3.02) and humanistic (C.R.=3.50) values. The remaining three values seem to be unrelated to their achievement.
- ii) The picture is, however, different as under and overachievers do not differ significantly on any of the six values. Of course, on educational, humanistic and religious values the difference between means are just on the border of significance.
- iii) Further, urban and rural underachievers differ significantly on personal and religious values and not on other values. On personal value the rural underachievers have higher mean scores (21.21) than urban underachievers (19.58), the C.R. being 3.26. On religious value the urban underachievers have a higher score (30.52) than the rural ones (28.31), the C.R. value being 2.16.
- iv) On the other hand, the difference between urban and rural overachievers is highly significant on educational value and nearly significant on social and humanistic values.

III. Parents' Values as Factors of Under and Overachievement

- A) The difference between the values of the parents of under and overachievers is highly significant (C.R. 3.51) only in respect of educational

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alues. On the remaining five values the difference is not significant. The verachievers have higher mean scores on educational value (37.70) than the nderachievers (35.40).

B) Urban-Rural Bias In Parents' Values of Under and Overachievement.

- i) The parents of urban under and overachievers differ significantly on educational and social values (C.R. 4.39 and 2.32 respectively). On educational and social values the urban overachievers have a higher mean score (38.26 & 35.51) than the underachievers (35.45 & 33.14 respectively).
- ii) But the parents of rural under and overachievers do not differ significantly on educational values as C.R. is .66. On social values, however, they differ significantly (C.R. 2.72).
- iii) The parents of urban and rural underachievers differ significantly on social values (C R. 2.22). The mean score of urban underachievers is higher (33.14) than the mean score (31.32) of rural underachievers.
- iv) On the other hand, the difference between the values of the parents of urban and rural overachievers is significant on educational and social values. The mean scores of urban overachievers on educational and social values are higher (38.26 & 35.51) than the mean scores (35.90 & 33.64) of rural underachievers, their C.R. values being 3.47 & 2.26 respectively.

IV. Socio-economic Status as Factor of Under and Overachievement

- i) The two groups did not differ significantly in this respect.
- ii) The urban and rural underachievers and urban and rural overachievers, however, differ significantly as their C.R. values are 3.00 and 6.11 respectively.

CONCLUSIONS

It may be concluded that underachievers in comparison with overachievers are less emotionally mature, less calm, less placid, less prone to getting into difficulties, less able to face reality, possessing less ego strength, less conscious, less persevering, less staid, less rule-bound, less ordered, less responsible, having weak superego, less adventuresome, less socially bold, less inhibited, less spontaneous, less responsive, less impulsive, less sufficient, less socially precise, less disciplined, less compulsive and having poorer self-concept and self-control.

Further, urban underachievers are more excitable, more impatient, more demanding, more overactive, more jealous, more self-assertive, more attention-getting, more tense, more over-wrought and more frustrated in comparison with rural underachievers. On the other hand rural underachievers are relatively more individualistic, more doubting, more obstructive, more reflective, more internally restrained, and more unwilling to act than urban underachievers.

Rural overachievers in comparison with urban overachievers are relatively more outgoing, more warmhearted, more easygoing, more participating, more trustful, more adoptive, and more social. On the other hand, urban overachievers are comparatively more apprehensive, more worrying, more depressed, more troubled, more moody, more controlled, more socially precise, more self-disciplined, more compulsive and have more self-concept control than rural overachievers.

Overachievers also have stronger educational, social and humanistic values than underachievers. The same is true for urban overachievers and underachievers. But rural under and overachievers do not differ significantly on any of the six values. Further, urban and rural overachievers laid more emphasis on educational, social and humanistic values, while rural underachievers on personal values. It seems these values are differentially associated with urban and rural overachievement.

The parents' values are also related to the academic achievement of their children. The parents of overachievers and urban overachievers are more interested in the education and social life of their children than the parents of underachievers and rural underachievers. To sum up, the study reveals that underachievers and overachievers differ with respect to certain psychological factors.

□

Effectiveness of Training in Interaction Analysis on Verbal Teaching Behaviour of Prospective Teachers

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INTRODUCTION

ONE of the major problems involved in effecting behavioural change is getting people to "do" in terms of what they "know". Combs (1958) summarizes one dimension of this problem when he says, "Modern psychology tells us that it is only when knowledge becomes meaning that behaviour is affected. If it is meaning that affects human behaviour, then it is meaning with which educators must deal." Thus the key to changing the behaviour of teachers seems to lie in finding ways of helping teachers discover personal meaning in cognitive knowledge regarding the teaching-learning process. Research on teaching in India has for a long time been conducted with the focus outside the classroom and, therefore, actual classroom behaviour of teachers has been ignored. Results are naturally

inconclusive. It is only in recent years that investigations into the nature, structure and modification of classroom behaviour are receiving notice from educational researchers and those interested in, and dedicated to the cause of education.

The teacher preparation programme can help a great deal in suitable modification of the behaviour of prospective teachers. Hence there is much to be learnt through continuous, objective and painstaking research to study the effects of various newly-developed teaching strategies on teacher behaviour. The present study has been undertaken to test the effectiveness of training in Flanders' Interaction Analysis System (FIAS) on the verbal teaching behaviour of prospective teachers.

METHOD

A sample of 120 (M=97, F=23) science and mathematics B. Ed. students was selected from four teacher education departments of Meerut University. The subjects were from two academic sessions. The experimental method was employed and the study was conducted through a pre-test post-test design.

PROCEDURE

Classroom verbal behaviour of all the subjects was observed through Flanders' ten-category system. Observation matrices were prepared and ten interaction variables¹ were computed for each matrix table. It was assumed that if the Flanders' System of Interaction Analysis (FIAS) was learned by student-teachers, it would provide them with a feedback mechanism which would increase the accuracy with which they could view their own student-teaching behaviour. Hence the 60 subjects of the experimental group were exposed to a comprehensive training in FIAS. Encoding and decoding of verbal behaviour in the classroom were taught to them, while the control group subjects proceeded traditionally. At the end of the teaching practice, the verbal behaviour of all the subjects was again encoded and the interaction variables were computed for all the observation matrices. For evaluating the gain, the direction of the difference rather than its existence in absolute terms was our primary concern. Hence the obtained data were subjected to one-tailed 't' test of significance.

Table 1 indicates that the 't' values for interaction variables 1, 3, 5, 6,

¹Ned. A. Flanders, *Analyzing Teaching Behaviour*, Addison Wesley Publishing Co., California, London, 1970, p. 394.

RESULTS AND DISCUSSION

The obtained results have been presented in Table 1.

TABLE 1
THE 't' VALUES FOR THE SIGNIFICANCE OF CHANGE IN INTERACTION VARIABLES

Sl. No.	Interpretation Variable	Symbol	Sum of Difference D	Sum of Squared Differences D ²	't' values df. 59
1.	Indirectness	i/j+d	1265.94	86655.1129	5.1272**
2.	Sustained Acceptance	(3-3) Cell	45.96	106937.1233	0.1378
3.	Indirect Influence	Cols. 1,2,3,4	426.65	8672.8113	5.634**
4.	Questions	Col. 4.	104.95	5934.8147	1.3723
5.	Teacher-Talk	Cols. 1& 7	-426.22	14096.3088	4.0173**
6.	Restrictiveness	Cols. 6 & 7	-289.17	11571.9907	2.8422**
7.	Restrictive Feedback	(8-6), (8-7) (9-6), (9-7) Cells	-373.71	48702.8713	1.7208*
8.	Negative Authority	(6-7), (7-6) Cells	64.65	6504.4459	0.7991
9.	Praise	Col. 2	101.02	1360.80	2.903**
10.	Flexibility	(high i/d-low i/d)	14.03	13.4769	4.5878**

* .10 level of confidence

** level of confidence .02

9 and 10 were obtained to be 5.1272, 5.634, 4.0173, 2.8422, 2.903 and 4.5878 respectively, which were significant even at .02 level of confidence. The sums of difference for these interaction variables were 1265.94, 426.65, -426.22, -289.17, 101.02 and 14.03 respectively. The null hypotheses were rejected. It may be interpreted on the basis of the above results that the science and mathematics student-teachers seem to have significant gain in interaction variables 1, 3, 9 and 10 (Indirectness, Indirect Influence, Praise and Flexibility) and significant loss in interaction variables 5 and 6 (Teacher Talk and Restrictiveness) due to training in FIAS.

Table 1 also reveals that the 't' value for interaction variable 7 (Restrictive Feedback) was 1.7208, which was significant at .10 level of confidence. Its sum of difference was -377.71. The null hypothesis was not accepted. It may, therefore, be stated that training in FIAS contributes to significant loss in Restrictive Feedback.

It may further be noted from Table 1 that the 't' values for interaction variables 2, 4, and 8 were recorded to be 0.1378, 1.3723, and 0.7991 respectively, which were not significant even at .10 level of confidence. The null hypotheses were not rejected. It may, therefore, be interpreted that training in FIAS may not contribute to the change in Sustained Acceptance, Questions and Negative Authority.

CONCLUSIONS

- The interaction variables Indirectness, Indirect Influence, Praise and Flexibility appear to have significant gain in the verbal behaviour of science and mathematics student-teachers trained in FIAS.
- The interaction variables Teacher Talk, Restrictiveness and Restrictive Feedback seem to have significant loss through the training in Flanders, Verbal Interaction Technique.
- The following significant changes may be noted from the classroom verbal behaviour of student-teachers trained in FIAS.
 - (i) Teachers tend to become more skilful in dealing affectionately and pliantly with the students.
 - (ii) They promote pupil initiation and thus maximize their freedom of action through praise and encouragement.
 - (iii) Teachers tend to have lesser discipline problems and more interchange.
 - (iv) Lesser amount of direction or criticism follows pupil response or pupil initiation; consequently they develop a better socio-emotional climate, which is conducive to learning.
 - (v) Teachers tend to ask more questions and stimulate more independent student thought.

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Sex Symbolism in African, American and Indian Culture

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PSYCHOANALYSTS suggest sexual meaning—masculinity and femininity—for objects, parts of the body, animals and dreams (Freud, 1952; Phillips and Smith, 1953; Gill, 1967; Mullen, 1968). Using the Semantic Differential technique (Worthy and Craddick, 1969; Archer and Burgess, 1970; Pachaury, 1973) the investigator found that the psychoanalytic theory of sexual symbolism is not supported for concepts 'ship, oven and room' as feminine and 'umbrella, necktie and hat' as masculine. The present study was aimed at finding cross-cultural differences African, American and Indian students' perception of 18 stimulus concepts presumed to symbolize masculinity or femininity (Table).

Method

In this study, each of the 18 stimulus concepts presumed to symbolize masculinity or femininity was rated on a Semantic Differential form on each of the six scales—Hard-Soft, Small-Large, Heavy-Light, Weak-Strong, Delicate-Rugged and Feminine-Masculine, all using the *potency factor* forms by Osgood, Suci and Tannenbaum (1957). Nine of the concepts were posited masculine by psychoanalytic theory, namely plough, eagle, wolf, ape, dagger, foot, umbrella, hat and necktie. Those posited feminine were ship, oven, room, sheep, pocket, purse, chicken, ear and butterfly.

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Sample

170 undergraduates, 85 male and 85 female students of the arts, science and commerce departments of the Regional College of Education, Mysore (1971-72), formed the sample of this study. The mean age of the sample was 21 years 8 months. The sample of this study corresponded to the African and American samples in regard to age.

Results

The Table reveals very little difference between the three studies. Of the 18 concepts, 17 in all the three studies are in harmony in grouping these concepts into either the masculine or the feminine categories. 'Foot' has been rated differently in these studies. It is below the neutral (24.00) by a score of 1.16 and 1.23 and above by 0.39 in Archer and Burgess (1970), Pachaury (1973) and Worthy and Craddick (1969) respectively. Even though there are differences in these studies on this concept, the results are very close. On the basis of the total score (Mean Potency) six reversals are encountered. 'Ship, Oven and Room' represent femininity psychoanalytically, yet these concepts are rated masculine in all the three studies. 'Foot, Hat and Necktie' represent masculinity, yet they are rated feminine in these studies, except in Worthy and Craddick (1969), in which the mean potency score of 0.39 is above the neutral value of 24.00.

Discussion

The method or process by which one symbolizes an object is not generally known. Psychoanalytic literature is also silent on this, although Isaacs (1952, p. 110) stresses that it serves the purpose of libidinizing the external world. Since the universality of Jungian and Freudian sexual symbols is questionable (Mullen, 1968), it would seem that they are not innate, and therefore must be learned. The criterion of 'holdingness', 'spaciousness', and 'cavernous', generally given feminine symbolic meaning, are untenable for African, American and Indian cultures, as 'Ship, Oven and Room' are rated masculine in these studies. 'Foot, Hat and Necktie' are rated feminine, though presumed to symbolize masculinity psychoanalytically. This can probably be best explained on the basis of Staats' (1968) integrated learning theory, where a word meaning comes to be associated by contiguity (Staats, 1968; pp. 34-40). The male is invariably associated with a 'ship' either in war or on a merchant ship and 'Oven' with the

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scientist in the laboratory, men in bakeries and allied places, while the *softness* of a 'hat' and 'necktie' comes to be associated with femininity. However, contiguity theory fails to give a reasonable explanation for the 'Room and Foot' concepts. More researches on psycho-social perceptions are warranted to clarify perception of sex symbols advanced by psychoanalytic study.

Summary

African, American and Indian subjects rated 'Ship, Oven and Room' as masculine. 'Foot, Hat and Necktie' were rated feminine, although psychoanalytic theory represents the reverse. These reversals are explained on the basis of Staats' integrated learning theory, where a word meaning comes to be associated by contiguity.

COMPARISON OF SEMANTIC DIFFERENTIAL MEAN POTENCY SCORES ON VARIOUS SEXUALLY SYMBOLIC CONCEPTS†

Stimulus	Archer & Burgess	Worthy & Craddick	Pachaury
PLOUGH	34.16	36.74	31.50
SHIP*	33.74	38.12	32.91
EAGLE	30.12	33.62	27.07
OVEN*	30.47	29.94	25.61
WOLF	29.93	33.68	29.40
APE	29.73	37.43	28.23
DAGGER	27.50	30.07	29.13
ROOM*	25.77	26.83	26.47
FOOT	22.84	24.39	22.77
SHEEP*	21.59	20.21	21.77
UMBRELLA	18.94	21.21	21.22
POCKET*	18.90	20.89	20.19
HAT	17.81	19.29	19.53
NECKTIE	17.01	21.12	18.88
PURSE*	16.97	17.19	19.94
CHICKEN*	14.61	16.14	16.15
BAR*	14.49	17.04	18.02
BUTTERFLY*	7.74	8.65	12.99

* Indicates those stimuli which are theoretically feminine; all others are theoretically masculine.

† Mean potency score over 24.00 indicates masculinity; scores below 24.00 indicate femininity.

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Book Review

Secondary Teacher Education Curriculum

B.N. Pandey and D.N. Khosla, NCERT, New Delhi, 1975, pp. 99

EDUCATION is to be an effective agent of social and economic change, as enunciated by the Education Commission (1964-66), the total scheme of education must be designed afresh. Projecting this idea to the future, one would imagine a society of citizens socially, economically, culturally and morally conscious and active. These new qualities would have to be developed through the educational system. The traditional system has not been found adequately responsive and equipped to meet new demands. The new pattern of education that has been envisaged for this purpose is not merely a structural change: it is a basic departure from the traditional one in terms of its aims, contents and approach. Schooling, in the new pattern would be a comprehensive and compact programme.

The teacher's functions and roles in the context of the new pattern of education, differently. His task would not only be to transmit knowledge, but also to act as an influencing agency. The functions of the teacher would thus extend from mere teaching of school subjects to organizing various other instructional experiences as indicated in the new curriculum. Further, a teacher would himself be expected to behave as a conscientious and enlightened citizen. Any teacher-education programme, to be relevant to the broader objectives of education, should equip the teachers to discharge these functions effectively.

The existing teacher-education programme has been facing severe criticism for its inadequacy to meet the new demands. A few theoretical papers have been written and discussions have been held to consider the change required. But, so far as developing and providing an alternative programme is concerned, there has been little effort. This book, therefore, is a welcome addition to the scanty literature on this subject.

Much has gone into the preparation of the book. The existing B.Ed.

programme has been analyzed, the opinions of educationists, teachers, and principals about the programmes have been sought, and reviews and reports on the subject discussed. Changes, in the light of comments received from teacher-educators and student-trainees, have also been suggested.

The book contains three sections. The first section presents the rationale for a change in teacher education, qualities of a teacher, and the methodology for developing the proposed programme. Section 2 has dealt with the role of the teacher with reference to general and specific objectives and the allocation of marks to different courses. The third section deals with the details of the proposed programme.

An attempt has been made in this book to highlight the need to change the programme of teacher education in the perspective of the new pattern. The qualities that a teacher should have in order to fulfil his new role have been highlighted.

The approach that has been used to build up the rationale needs close scrutiny. The authors have depended heavily on 'quotes'. While there is nothing wrong in using quotations, they should be relevant to the issue. The quotations from Prof. H.B. Mazumdar, the UNESCO resolution, and the Sampurnanand Committee, emphasizing teachers' role in society as well as in the school are informative. But interpreting these quotes to come to a logical stand could have helped in developing the theoretical framework in a better way.

Moreover, several contradictions are contained in the discussion about the need for change in teacher-education programmes. It has been mentioned, for instance, that "the programmes of preparation of teachers at post-graduate level have changed considerably during the past 20 years. These have taken note of new demands on the teacher". On the next page, one reads that "the activities that we are following in our teacher-preparation programme today lack a great deal in meeting the modern new demands". Further, it has been mentioned that "there is full influence of educational psychology in our programmes. Emphasis has also widened to include the entire spectrum of a teacher's work in and outside the class and even outside the school". On a preceding page, it has been stated, "..... in spite of all these innovations and changes, there is something vital". Besides such contradictions, there are the vague statements; "the concept of equality of opportunity is not very clear to our teachers and something has to be done in our training colleges to bring this point of view home to teachers so that they could educate the masses for availing themselves of the opportunities as provided in our Constitution." Neither has this role been specified nor has it been reflected in the training programme suggested. As a result of these the rationale has remained rather diffused. Instead, it could have been built up by considering the process of relating education to national development in a more scientific and concrete manner.

The list of the qualities of a teacher (pp. 6, 7, 8) is quite comprehensive. This list has been further supplemented by several other lists (Barr, p.6, Conant, p.9). But it is not very clear from the presentation which list has been the actual frame of reference of the authors, for developing the curriculum. Specification of the teacher's qualities in these lists do not have a common base. Also, opinions on the teacher's qualities have not been corrected with a particular end in view. Since the purpose of identifying the teacher's qualities was with reference to the new ten-plus-two schooling pattern, this could have been specified while collecting opinion on the teacher's qualities. In the absence of any such specific reference, the opinions collected remain of an ad hoc nature and do not seem to serve the purpose of the study. Mention has been made of some Indian researches on the qualities of teachers. It would have been better if the details had been reported.

The title of the second chapter is 'Role, Objectives and Programme.' The chapter starts with a quotation which is followed by specifications of the different objectives of teacher-education programmes. Conspicuously enough, there is no discussion on the role of the teacher. The objectives of teacher-education programmes are considered under two main heads—general and specific objectives. These objectives cover the usual pedagogical aspects of a teacher-education programme. The new role of the teacher emerging out of relating education to national development has not been taken note of.

The specification of objectives is immediately followed by an allocation of marks to different courses without any discussion or rationale for this. Without any such rationale, distribution of marks to theory and practicals in the ratio of 6:4 seems to be an arbitrary view of the teacher-education programme and its components. Instead, this allotment of marks could have been decided on the basis of relative weightage to different functions for which a teacher is to be prepared through the programme. The evaluation scheme to be followed could also have been mentioned.

The scheme of organizing the courses under theory papers, method papers, optional, special field papers, and practical work, resembles the existing pattern in different universities in India. Theory papers, which could more appropriately be called core courses, comprise subjects such as the philosophical and sociological foundations of education and school organization, educational psychology and elementary educational statistics and the problems of Indian education in historical perspectives. Topics covered under different courses in the proposed syllabus and the existing syllabi in the different universities are similar. But the distribution in the different courses is not quite so; e.g. 'national integration', which appears in the philosophical and sociological foundations of education of the proposed

syllabus, appears in the course on the problems in the M.S. University syllabus. Two courses—'Mental hygiene, adjustment and health education,' and 'trends and techniques of classroom teaching' are included as core courses in the B.Ed. syllabi of the universities of Gujarat. Whether these courses should find a place in the proposed syllabus requires consideration. Inclusion of 'educational models' seems to be a good addition. Along with the foreign models, indigenous models (p. 13) could also have been presented. Interrelated topics in the same as well as in other papers could have been dealt with in an integrated manner. This has not been done. In the proposed syllabus one finds alternate forms of the course on educational psychology and elementary educational statistics (p. 17-19). However, there is no mention of either the need for such an exercise nor any discussion on the basic differences or similarities between the two forms. Apparently there are only minor differences on account of which certain topics have been included in one form and certain others in the other. The subject 'art, music and other aesthetic activities,' which has been mentioned in *The Curriculum for the Ten-year School* (NCERT, 1975), has been left out in the proposed syllabus.

At the end of the book under the 'Minimum Essential Practical Work' recommended, several new demands on the teacher's role have been accommodated. The large number of activities suggested would go a long way towards relating education to national development. However, in their organization and theoretical background, one finds a lack of coherence. Further, though most of these activities are relevant and necessary for a teacher-education programme, logically, they do not follow from the objectives of the programme stated earlier. Many of the activities ought to be related to the relevant theoretical courses—work on school records should be related to the course on school organization, the activities of woodwork, leather-work, etc. should be related to work experience. A synchronization of these related elements would add to the effectiveness of the total programme proposed.

Going through the references given at the end of each course, one is amazed to find that a large number of references have been made without proper details regarding the author's name, publisher, year of publication, etc. The references are also not up-to-date.

The approach for developing the new programme—through analysis and revision of the existing syllabi of B.Ed.—does not seem to be very appropriate since the framer would continue to work under the constraints of the existing framework. This would not allow his imagination free play to work out the new objectives and corresponding programmes. A less inhibitory approach, perhaps, would be to start with a logical and imaginative analysis of the teacher's functions in future. On the basis of this analysis,

the objectives of the programme could be specified. For each objective, the corresponding theoretical and practical programmes could be identified. This might call for greater flexibility in visualizing the programme in terms of theory courses and practical work. Related units with necessary practical work may be clubbed together to form the courses. This could, perhaps, make the programme more relevant to the objectives formulated.

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112 BOOK REVIEWS

Effects of Revaluation on the Results of Candidates Appearing at the University Examinations

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SUBJECTIVITY in evaluation and lack of reliability of the marks have been considered to be the weakest aspects of the examination system in our universities. Personal biases, errors of measurement and unusual fluctuations in marking by different individuals are some of the reasons which brought disrepute to external examinations. Cieslak, Cowles and Dragositz (1959) have observed, "At present, most of the systems for evaluating examinations which are used by the universities visited by the American team are such that the results cannot be considered reliable. At times, the procedure is such that the ultimate decision as to a student's mark rests solely in the hands of one person. Even where more than one examiner is involved in marking a paper, usually the reconciliation of any differences in marking will, in the last analysis, be determined by one person. They have further remarked, "Since the student's academic, social, and vocational fate now hinges on the results of the external examinations, the lack of reliability of the marking system is even more serious than it would be if the examination results were less decisive. The need for procedures to correct this situation is urgent".

It has been contended that the marks earned by a student in a paper

indicate not only his ability in the subject, that too inadequately sometimes, but also the variation between the examiners. Husbands (1976) has pointed out: "Even some of the research that has been done on the lack of reliability in the marking of examinations suffers from simplified notions about the sources of error and variation in awarded marks. All writers agree, of course, that inter-candidate variation in quality is the only variable that should be reflected in the ideal examining scheme and they are likewise agreed that variations between examiners additionally affect the results achieved in practical situations; however, the exact components of the variation between examiners are usually not fully explored or substantiated".

That the observations made by Husbands are true is supported by the lack of well-planned and systematic studies on the reliability of the examination marks or on the study of variations between examiners. The results by Harper (1970) revealed that Indian examiners as compared to those from other countries (France, England and U.S.A.) seemed to be slightly more reliable. Members of the committee on the Indian Examinations Reform Project also deliberated on the unreliability of the examination system and in their Report recommended that the assessment of essay-type answer should be done by two examiners and the average of the two scores be taken as a measure of the student's achievement. In keeping with this suggestion, some Indian universities have incorporated the system of revaluation of the examination papers where a fresh set of examiners is asked to reevaluate the papers.

The original result of the candidate can be changed on account of revaluation for which the university frames rules. But there have been so far, to the best of the author's knowledge, no studies on the effects of revaluation. Whatever work on reliability is available points only to the changes in marks. But there has been no systematic effort to investigate how these changes can affect the results of the students appearing for university examinations. Sometimes an increase of even one mark or two may help a student who has failed to get through or may place him in second division instead of third. Not always are large increments of marks required to change the result of the students. Since many universities are now introducing revaluation as a step for overcoming the weakness of examinations, it is essential at this stage to scrutinize the effectiveness of revaluations in changing the examination results of candidates. The author, therefore, undertook this investigation and took advantage of the facilities in one of the Indian universities where revaluation was introduced as a corrective measure for the unreliability of examination marks. The revaluation system provided an excellent opportunity to probe into this problem systematically. The main objectives of the study were framed as follows.

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- i) To study if revaluation changed the marks of the candidates appearing for the university examinations;
- ii) to study the extent of the change of marks, if any;
- iii) to study how the change of marks changed the examination results of the students;
- iv) to study the reliability of the examination marks as a whole, specially the scorer's reliability.

METHOD AND PROCEDURE

University Rules for Revaluation

According to the decisions of Indore University taken in December 1965:

- i) When allegations of prejudice, hostility and the like are made by a student against an examiner and, if in the opinion of the Vice-Chancellor, they seem *prima facie* to be justified, the student should be asked to deposit a fee of Rs. 50 per paper in respect of which allegations have been made.
- ii) After the fee has been received, the Vice-Chancellor should get the paper valued separately by two examiners, to be selected by him; to help them do so, he will supply each of them with ten answer-books adjudged by the Head Examiner as models of valuation, together with a copy of the Head Examiner's instructions regarding correct valuation and marking.
- iii) The average of the marks awarded by the two examiners should be taken to represent "correct valuation".

Further decisions deal with the extent of disparity between the "correct valuation" and the valuation done by the examiners and the actions to be taken against the examiners or the students.

The above rules were applied only rarely. In 1972, however, the university took the decision that these facilities should be extended to all cases of complaint. This was the beginning of revaluation in the 1973 examinations at Indore University.

The advantage of the increased marks as a result of revaluation of the answer-books is granted by the university as follows :

A candidate failing in the examination and applying for revaluation of his answer-books may get the benefit of one or more increased mark as a

result of the revaluation to pass in the examination or in a subject or subjects or to improve the division. In this case the advantage of grace marks can also be given if this helps the candidate to pass. The Vice-Chancellor's grace mark (one grace mark only) can be granted to improve the division if the candidate is passing on account of the above-mentioned conditions. A candidate already passing gets the advantage of increased marks of more than five in a paper, in which case the fees paid for revaluation are refunded. In case the marks decrease on account of revaluation, original marks can be retained and the fees paid are forfeited. For improving the position in the merit list, the advantage of increased marks by more than five only is given to the student.

The Sample

All the 584 candidates who had applied for revaluation of one or more papers in the 1973 Indore University examinations formed the sample for this study. The university examinations were B.Sc. Parts I, II and III, B.A. Parts I, II and III, B. Com. Parts I, II and III, M. Sc. and M. A. Previous and Final and M. Com. Some of the candidates had applied for revaluation of more than one paper. The total number of papers revalued, therefore, was 815.

Procedure

For each candidate applying for revaluation information was obtained from the university office,* with respect to the examination taken by the candidate, subjects and papers for which he applied for revaluation, maximum marks for all these papers, the status of the candidate—whether passed or failed on the original result, the original and the revalued marks, and the change in the result on account of revaluation. Since maximum marks were different for different papers, subjects and examinations, the obtained marks, both original and revalued, were converted to the maximum of 50 to bring them all on a common basis for comparison. The choice of 50 as the maximum marks was purely incidental but based on the fact that a very large number of papers had 50 as the maximum marks and the conversion therefore was reduced to the minimum.

*The thanks of the author are due to the officers of Indore University who accorded permission and provided all the data for this study.

TABLE 1

NUMBER AND PERCENTAGE OF CANDIDATES APPLYING FOR REVALUATION IN EXAMINATION PAPERS, 1973

Gr. No.	Group	Number	A.R. applied for revaluation	Percentage of A.R. out of appeared for Exam.	Passed	A.R. of A.R. out of 'Passed'	Failed	A.R. of A.R. out of 'Failed'
1	B.Sc.—I	2346	74	3.2	669	0	1677	74
2	B.Sc.—II	913	42	4.6	399	0	514	42
3	B.Sc.—III	789	68	8.6	361	2	428	66
4	M.Sc. Prev. + Final	305	10	3.3	265	4	40	6
5	B.A.—I	4178	42	1.0	1558	2	2620	40
6	B.A.—II	3682	68	1.8	1681	1	2001	67
7	B.A.—III	2514	89	3.5	1260	3	1254	86
8	M.A.—Prev. + Final	2907	79	2.7	2151	40	756	39
9	B.Com.—I	1776	31	1.7	787	0	989	31
10	B.Com.—II	1036	37	3.6	510	2	526	35
11	B.Com.—III	901	36	4.0	447	4	454	32
12	M.Com. Prev. + Final	591	8	1.4	505	6	86	2
Total 12 Groups		21938	584	2.7	10593	64	11345	520
								4.6

TABLE 2

EFFECT OF REVALUATION ON THE RESULT OF THE CANDIDATES

Gr. No.	Group	Already		Passed (AP)		Failed (F)				Total (AP+F)	
		Marks Merit Changed	Increased Division Changed	Division not Changed	No Change	Total	Passed with Grace	Cleared Subject	No Change		
											Marks
1	B.Sc.—I	0	0	0	0	0	18	3	2	51	74
2	B.Sc.—II	0	0	0	0	0	9	0	3	30	42
3	B.Sc.—III	0	0	0	2	2	27	1	0	38	68
4	M.Sc. Prev.+Final	0	0	0	4	4	1	0	0	5	10
5	B.A.—I	0	0	0	2	2	23	0	2	15	42
6	B.A.—II	0	0	0	1	1	28	0	0	39	68
7	B.A.—III	0	2	0	1	3	34	0	3	49	89
8	M.A. Prev.+Final	0	2	7	31	40	15	0	0	24	79
9	B.Com.—I	0	0	0	0	0	16	0	0	15	31
10	B.Com.—II	0	0	2	0	2	20	1	2	12	35
11	B.Com.—III	0	1	1	2	4	14	0	0	18	36
12	M.Com. Prev.+Final	0	0	3	3	6	00	0	0	2	8
Total	12 Group	0	5	13	46	64	205	5	12	298	584
% out of Group AP or F		0	7.8	20.3	71.9	100.0	39.4	1.0	2.3	57.3	100.0
% out of total AP+F		0	0.9	2.2	7.9	11.0	35.1	0.9	2.0	51.0	100.0

RESULTS AND DISCUSSION

The numbers and percentages of AR (Applied for Revaluation), AP (Already Passed) and F (Failed) in each examination as well as for the whole group are presented in Table 1.

It is evident that a very small number of candidates, *viz.* only 2.7 per cent out of those who took the examinations applied for revaluation, and over 97 per cent did not evince any interest in it. More students from the undergraduate classes, particularly those taking the examinations, desired to take advantage of revaluation. These results, of course, must be considered in the light of the fact that this was the first year in which the university offered revaluation of answer books. As the years go by, these percentages might show a rising trend.

Comparing the numbers of AR with the AP and F groups, a very interesting point emerges; those who apply for revaluation mainly came from the failed group. From the AP group, some of the percentages are highest for postgraduate examinations and largest percentages in the failed group are for undergraduate classes. These observations suggest the possibility of the psychological explanation to be the same for both the groups, though of a somewhat different nature. Already Passing candidates desire revaluation in the hope of improving the merit position or the division; ordinarily a third division in an examination makes admission to educational courses or employment difficult. But the Failures have a definite purpose in going in for revaluation—they want to get the pass marks.

In Table 2 are shown the effects of revaluation on the changes in the result of the candidates.

The total 'No change' cases are about 59 per cent while for 41 per cent the result has changed, which is a fairly large percentage. Of course, this figure includes those cases where marks were increased but otherwise there was no change in the result as well as those cases among failures where they cleared some subjects or groups but the declared result remained as failed. Correcting for these two groups, the number where the result actually changed in terms of change in merit or division in the AP group is only 18; *viz.* about 28 per cent. And it is noteworthy that the merit changed not in a single case and all the cases of change in division were from third to second and none to first.

From the Failed group, the number of those passing on account of revaluation is 210 which comes to about 40 per cent. This is a serious matter in the sense that these 210 students would have been declared failed had the university not given them the benefit of revaluation. As

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compared to the AF group which did not gain much, the F group largely benefited by revaluation.

The number and percentages of Result Changed and No Change cases without the detailed analysis given earlier are presented here in Table 3, for ready comprehension of the effects of revaluation on the change in results.

TABLE 3
PERCENTAGES OF CHANGE AND NO-CHANGE IN THE RESULTS
AS AN EFFECT OF REVALUATION

Gr. No.	Group	Result Changed	Percentage	No Change	Percentage	Total
1	B.Sc.—I	23	31.1	51	68.9	74
2	B.Sc.—II	12	28.6	30	71.4	42
3	B.Sc.—III	28	41.2	40	58.8	68
4	M.Sc. Prev.+Final	1	10.0	9	90.0	10
5	B.A.—I	25	59.5	17	40.5	42
6	B.A.—II	28	41.2	40	58.8	68
7	B.A.—III	39	43.8	50	56.2	89
8	M.A. Prev.+Final	24	30.4	55	69.6	79
9	B.Com.—I	16	51.6	15	48.4	31
10	B.Com.—II	25	67.6	12	32.4	37
11	B.Com.—III	16	44.4	20	55.6	36
12	M.Com. Prev.+Final	3	37.5	5	62.5	8
Total		240	41.1	344	58.9	584

If revaluation could change the results of as many as about 41 per cent of the candidates, it should receive serious consideration and support for its continuation and incorporation in other universities. It will be clear that the largest percentages for Result Changed (more than 50 per cent) are in groups B.Com. I, B.A. I and B.Com. II. The No change cases have the highest percentages for the group M.Sc. Previous and Final followed by B.Sc. II. The obvious conclusion of this analysis is that Arts and Commerce subjects are more sensitive to revaluation and in Science courses, revaluation has little effect. A deeper subject-wise analysis was attempted to find out which subjects are more susceptible to revaluation, but the results could not be presented here due to the very small number, sometimes just 1, 2 or 3 for each subject.

In the second type of analysis, all the papers were taken into account.

Table 4 gives the frequency distributions of the original and revalued scores.

TABLE 4
FREQUENCY DISTRIBUTIONS FOR ORIGINAL AND REVALUED SCORES

<i>Scores</i>	<i>Frequencies</i>	
	<i>Original scores</i>	<i>Revalued scores</i>
45-49	1	0
40-44	0	2
35-39	0	1
30-34	9	8
25-29	18	40
20-24	77	102
15-19	217	280
10-14	349	272
5-9	126	100
0-4	18	9
	N=815	N=815

The resemblance in the two distributions is remarkable, suggesting that the difference in the distribution of these two sets of scores is not wide. Assuming complete unreliability of the first evaluation, one should expect large differences in the two distributions, which is not substantiated by these results.

Table 5 reflects the frequency distribution of the difference scores.

TABLE 5
FREQUENCY DISTRIBUTION FOR THE DIFFERENCE SCORES

<i>Difference Scores</i>	<i>Frequencies</i>
10-11	4
8-9	1
6-7	22
4-5	83
2-3	250
0-1	320
-2- -1	104
-4- -3	20
-6- -5	7
-8- -7	3
-10- -9	0
-12- -11	0
-14- -13	0
-16- -15	1
	N=815

It is evident that the largest frequencies are within the range of -2 to $+3$, which constitute almost 83 per cent of the total frequencies. The fact that the majority of the cases have not yielded differences exceeding the given range lends support to the considerably high reliability of the examination marks. The range of differences of 26, however, is large, though the extreme case are very few.

The means and standard deviations for original and revalued marks as well as those for difference scores between the two, and the 't' ratios for differences between the means of the original and revalued marks for each group and for the total group are presented in Table 6.

TABLE 6
MEANS AND STANDARD DEVIATIONS FOR ORIGINAL AND REVALUED MARKS AS WELL AS FOR DIFFERENCE SCORES BETWEEN THE TWO AND 't' RATIOS FOR DIFFERENCES BETWEEN THE MEANS OF ORIGINAL AND REVALUED MARKS

Group	N	M-1	SD-1	M-2	SD-2	MD	SD D	't'-ratios	Level of Sig.
1 B.Sc.—I	126	12.5	4.7	13.3	4.7	0.8	2.1	4.37	.01
2 B.Sc.—II	58	13.1	4.2	13.6	4.6	0.5	2.5	1.67	NS
3 B.Sc.—III	96	13.0	4.8	14.9	4.9	1.9	1.9	9.74	.01
4 M.Sc. Prev. +Final	16	19.2	3.5	18.8	3.6	-0.4	5.3	8.43	NS
5 B.A.—I	58	14.5	3.6	15.8	4.5	1.3	2.0	4.81	.01
6 B.A.—II	83	12.6	3.9	13.8	4.4	1.2	2.3	4.84	.01
7 B.A.—III	120	12.4	4.1	13.7	4.3	1.3	2.5	5.52	.01
8 M.A. Prev. +Final	111	17.9	7.3	18.9	7.0	1.0	2.2	4.57	.01
9 B.Com.—I	36	12.7	3.6	14.5	3.6	1.8	2.3	4.64	.01
10 B.Com.—II	47	14.1	5.3	16.1	5.6	2.0	2.1	6.23	.01
11 B.Com.—III	54	14.4	5.3	16.6	6.1	2.2	2.2	7.07	.01
12 M.Com. Prev.+Final.	10	21.4	6.4	22.9	6.4	1.5	2.4	1.97	NS
TOTAL	815	13.9	5.3	15.2	5.5	1.3	2.3	15.75	.01

M-1 *Mean of Original Marks

M-2 *Mean of Marks after revaluation

MD—*Mean of the Diff. of 1 and 2.

For the original marks, higher means are found for all the postgraduate examinations, ranging between 17.9 to 21.4, while for the undergraduate courses the range is 12.4 to 14.4, which points to the trend of marking in

the undergraduate and postgraduate examinations. Selective admissions on merit at the postgraduate level can be one of the factors contributing to this difference. In the revalued marks the same trend is repeated, the range for postgraduate groups being 18.8 to 22.9 and for undergraduate groups 13.3 to 16.6. The ranges have improved in both the cases due to revaluation. The mean difference is only 1.3. On the 101-point scale this will turn out to be about 2.6. The difference, however, is statistically significant at .01 level, the 't' ratio being 15.75. In almost all the cases the difference is significant at .01 level so that one can conclude that there is a genuine difference in the original and revalued marks. One must, however, keep in mind that these averages do not represent the total group for each examination but are the averages only for those who applied for revaluation. Generally, high achievers are not interested in revaluation.

Another interesting observation is that the groups, more or less, retain their respective positions with respect to the means even after revaluation. To confirm this, rho was calculated by ranking M1 and M2 separately, which came out to be .89, which is a high correlation. The coefficients of correlation (Product-moment) were worked out between the original and the revalued marks for each group as well as for the whole group to enable us to calculate the scorer's reliability of examination marks. These are given in Table 7.

TABLE 7
CORRELATION COEFFICIENTS BETWEEN THE ORIGINAL
AND THE REVALUED MARKS

Group	N	r
1 B.Sc.—I	126	.91*
2 B.Sc.—II	58	.84*
3 B.Sc.—III	96	.93*
4 M.Sc. Prev. + Final	16	.25*
5 B.A.—I	58	.89*
6 B.A.—II	83	.85*
7 B.A.—III	120	.83*
8 M.A. Prev. + Final	111	.95*
9 B.Com.—I	36	.80*
10 B.Com.—II	47	.93*
11 B.Com.—III	54	.94*
12 M.Com. Prev. + Final	10	.93*
TOTAL	815	.91*

*t' *significant at .01 level

The 'r' between the original marks and the revalued marks for the whole group is .91, significant .01 level. Considering that for most of the psychological tests, the reliability coefficients vary between .70 to .98, the 'r' of .91 can be taken as very high, pointing to the reliability of the examination marks. This also disproves the tall claims for the unreliability of the examination marks. A note of caution is, however, necessary here for understanding the size of the correlation. In this particular system of revaluation the original marks could be seen by the two new revaluators who could possibly and unconsciously be influenced for various reasons in revaluation by the original marks, thus yielding small differences between the original and the revalued marks. Investigations of similar nature involving fresh valuation where the original marks are not visible to the new * examiners can be quite interesting for comparison with the present results, for which efforts are being made. The correlations for the different groups are also considerably high, ranging between .80 to .95, except for M.Sc. Previous and Final in whose case the 'r' is only .25, which is not significant even at .05 level. And this was the very group which gave the largest percentage, viz. 90 for the 'No Change' cases. This apparent contradiction stems from the fact that in many cases in this group, the marks in revaluation were reduced, but according to the university regulation, the original marks were retained. This produced a large number of 'No Change' cases in results for the candidates but lowered the correlation coefficient. In fact, a feeling is voiced in some quarters that a student applying for revaluation must be made to take the risk of accepting lower marks in revaluation if it comes to that. The advantage or disadvantage should go both ways. Many universities are incorporating these practices.

A suggestion or two at this point would be in order. If a candidate has applied for revaluation hoping for a change in his merit position, the answer-scripts of those candidates also who are likely to be affected by the change in his result should be revalued by the new examiners to compare the respective answers and finally decide the merit position. The fees may not be returned to any candidate, because, after all, the university incurs expense on the revaluation.

It appears that there is a lot of scope for work on this problem and the author has secured a UGC research fellowship to probe further in this area.

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Education and Social Change

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Education is a conscious process of attaining self-awareness and social awareness. It tends to transform both the individual and society through progressive manifestations of new knowledge. It is also true that through individual realizations a seeker assimilates and absorbs the values of education. The values that are inherent in education and the values that are laid deep in the life of the individual are not separate. Social change is a transforming process. It is the end-product of education. But at the same time, social change presses upon the value trends in education to generate new concepts which again are passed on to the society.

"What Nutrition and Reproduction are to physiological life, Education is to social life."

—JOHN DEWEY

EDUCATION AND SOCIAL CHANGE are interrelated concepts. As a medium of social change, education operates in society from diverse angles and aspects. The most commonly observed forms in our country are: social education, adult education, child education, women's education, education of tribals, handicapped and the oppressed. Both government and non-government agencies are involved in the above processes which finally contribute to social change. A centre or institution which does not try to bring about social change does not perform its true function.

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Thus, an educational institution has a tremendous social responsibility. On the one hand, it has to strengthen the forces of change, on the other to preserve our rich heritage. Education is an instrument in the service of man in his struggle for better society. In this context, it is rather difficult to uphold the cause of knowledge for its own sake. It is equally true to say that unless we bring education that is imparted in our schools and colleges closer to our social goals, we cannot bring about social transformation. Educationists are of the opinion that educational institutions should take an active part in effecting and directing social change.

The present educational environment neither represents the past classical order nor the new social perspectives. Social reconstruction does not stand for wholesale repudiation of our cultural heritage. It implies a fresh interpretation of classical values, ideals and traditions in the light of current social situations. In this sense, education has been rightly defined as a continuous reconstruction of one's knowledge and experience.

Social change implies a structural and functional change in society. Educational reconstruction includes in its scope curriculum construction relevant to significant social problems. Sometimes it so happens that a conflict develops between the advocates of education for its social purposes, and those who claim that it must cater to the needs or the interests of the students. On such occasions, it becomes all the more difficult on the part of the educationist to resolve the contending claims.

It is, in fact, very difficult to define what is social change. Social change does not merely imply a structural and functional change in the various norms and roles of society; it also implies a change in its cultural system, beliefs, ideals, traditions and practices.

Plato wrote in his *Republic* that the individual must be helped to find a place in society for which he is best suited; this has been the avowed aim of education. The Greek tradition interpreted education as a continuous re-examination of social ideals and beliefs. The Greeks were also of the opinion that intellectual reconstruction is meaningless without corresponding educational or institutional reconstruction. Educators must concern themselves with the educative effects of institutional structures.

According to John Dewey, education is a process of social reconstruction which makes for increased social efficiency. Increased social efficiency implies the development of all such capacities in individuals which enables them to construct their environment and realize their potentials.

When we include character formation, development of personality, social efficiency, enlightenment and discipline under the aims of education, it implies a corresponding change not only in the sphere of educational environment, but a change in the larger community or society of which the educational environment is part. So also, when we refer to vocational aims

of education, a social change—both functional and structural—is implied. For this reason the Greeks intended to build up a strong society through a programme of education. In this programme the good of the individual was never distinguished from the good of the state. Education is not confined to imparting bookish knowledge only; it embraces in its scope the diverse activities of social life. Good citizenship, a spirit of tolerance, etc. are the social aims of education. The other major variables of education and social change include the ego-ideals, the individual differences, the change of values in terms of different social strata. In this context, the school is considered to be a microcosmic social organization from the point of view of its structural, functional and cultural integrity. The common agencies of social change which are often referred to, apart from education, are political freedom, industrialization, mass communication media, individual achievement motives and above all the collective aspiration of the people for better living. A school is thus considered as a sub-system of the total social system. Both the developing civilizations and the developed countries, races and nations of the world are fast aiming at a thorough and rapid change in their social structures and patterns of living. This is what we call social progress through education.

It is rather difficult to explain and interpret from an academic angle as to how and in what manner education brings about social change or transformation. Educationists and the philosophers of social change are all agreed on the point that 'innovation diffusion' has been the most effective and powerful medium of social change, and that innovations in education are bound to lead to changes in society. Educational change invariably implies social change.

Education influences the spiritual, moral, economic, and family life of the people. The development of democratic attitudes, participation of the people in political affairs, etc. are directly or indirectly included under the bio-social and cross-cultural variables. Thus, in this particular sense, the educational system is a product of the interplay of these forces and expansion of education and the democratization process are interchangeable variables from the point of view of the mechanism of social change.

Social change refers to the diverse modifications which take place in the life patterns of the people. Education helps in minimizing class and caste prejudices, eliminating social distances, and inculcating social awareness. Equality of opportunity, division of work, dignity of labour, involvement of the individual in social reconstruction, and similar values and ideas are bound to be brought into the forefront of human consciousness through the medium of education.

Education as a medium of culture, individual evolution and social wel-

fare is bound to encourage diverse patterns of prosperity and social change. The socio-economic status effecting achievement and achievement motivation, however, leads to cultural comprehensiveness of individuals in society. Social problems—problems of social mobility, social integration and social order—are directly influenced by education. Even concepts like secularization, modernization, socialization and humanization gain impetus under the stress of new patterns or models of education. Education for growth humanistic education and education for human progress and fulfilment, etc. have been greatly encouraged, particularly in recent times.

The mechanism of social change and the process of education are interpenetrating concepts. However, on occasions of exigency or emergency, resistance to social change is bound to develop, as in the case of conflicts, wars, etc. The nature of state or polity, religion, class or caste stratifications, decline of national morale and character, under conditions of social alienation, conservatism and passivity, etc. are bound to affect the progress or decline of social change or transformation.

Indoctrination is a strategy as much as it is a device of education. Traditionalists are of the view that social change through indoctrination does not stand the test of time as it is opposed to the techniques of rational analysis and pursuation. When the pace of progress of a nation, particularly a developing nation, is to be encouraged or enhanced, social indoctrination is largely successful.

Education, as it is imparted in our country with its alien legacy and ideology has failed to have an impact on our national aspirations. A sense of alienation has crept in, so that we lack a sense of involvement in all our endeavours, responsibilities, obligations and duties. It is here that we must differentiate between the role of a creative thinker or a planner and a professional educator. A creative educator never loses sight of the 'distant goals' and he is always alert in executing his plans and schemes. On the other hand, a professional educator has no such insight. He is more interested in securing government funds for education. He is not aware of the fact that people's interests and energies are far more valuable than government sanctions. He cannot decide between the rival claims of a village, a town and a metropolitan city from the point of view of desired social change. The need of the hour is a goal-directed society which lays equal emphasis on 'immediate needs' and 'distant goals.' While the immediate needs must be satisfied, the distant goals are equally important from the point of view of long-range planning in education. Thus, while effecting social change through education, we must not lose sight of either the immediate or the distance goals, if we are to avert a crisis of faith and endeavour in education.

□

An Econometric Model for Teachers' Requirement

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The authors discuss a theoretical model of teachers' requirement based on demand-supply reasoning and take into account the varying rates of enrolment, screening and dropouts. The mortality condition of teachers and students have been also considered.

Introduction

TODAY increased production efficiency is of deceptive importance, and a proper evaluation of the economic aspects of education is a basic condition for the proper use of human resources. A country which does not make use of its human resources in accordance with its needs in different social activities is bound to suffer. One of the measures of effectiveness of an educational system is how it plans the role of its trained personnel in the national economy and their actual employment. Manpower planning is more important for the underdeveloped countries; there are numerous outlets for a possible excess of a given kind of skill. But an unplanned development may lead to unemployment of educated individuals, who would create pools of discontent apart from the implications in terms of investment being unutilized or underutilized. In India one of the reasons

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behind unemployment is that education is not related to the needs of the employment situation (Nayar, 1975). If we look at the history of educated manpower growth in India, we find that there have been fluctuations in the demand and supply of manpower in various sectors of national enterprises. A dominant feature in this country has been fairly large scarcities or excess supplies of engineers and teachers because the composition of the output system has not always matched the requirements of production sectors (Second All India Educational Survey).

Attempts have been made to construct models for balancing the demand and supply of teachers for school education. Thonstad (1964) developed a model of an educational system, deriving formulae for teachers' requirement, enrolment of pupils, etc. as a function of the educational distribution of the non-teaching force. Thonstad and Stone (1965) suggest a formal treatment of the whole educational system as a set of processes with coefficients of requirement for various types of inputs, e.g. teachers, class size, instructional method, etc. per pupil. The model prepared by them lacks applicability in the Indian situation as there is an assumption of a stable population and there is no screening and dropouts do not occur. In this paper it is intended to present a model for teachers' requirement to cover the Indian situation, where the annual number of potential entrants to school varies from year to year, and there is screening at all levels and dropouts occur in each class.

Notation

The variables under consideration may be denoted by the following symbols :

- E_t : Total enrolment at time 't' in the sector.
- T_t : The number of trained teachers at time 't' in the sector.
- U_t : The number of untrained teachers at time 't' in the sector.
- G_t : The gross teaching force at time 't' in the sector.
- n_t : The entrants per year at time 't'.
- g_t : The supply of trained teachers per year at time 't'.
- u_t : The supply of untrained teachers per year at time 't'.
- $l(x)$: The number of survivors at age 'x' out of a cohort of 1 (o) persons.
- x_g : The graduation age of teachers in the sector.
- x_r : The retirement age of teachers in the sector.
- $h_1(x)$: Fraction of trained teachers participating in teaching at age 'x'.

AN ECONOMETRIC MODEL FOR TEACHERS' REQUIREMENT

- $h_u(x)$: Fraction of untrained teachers participating in teaching at age 'x'.
 k_y : Fraction of students enrolled in (y-1)th class and continuing in the 'y' th class of the sector.
 λ : Educational duration.
 μ : Teacher-pupil ratio.
 x_g : The enrolment age of students.

Assumptions

- i) All the variables are non-negative.
- ii) The graduation age for trained and untrained teachers in the sector are equal and both the groups are exposed to the same mortality condition.
- iii) Screening and dropout in a class occur at a constant rate through all the years.
- iv) Mortality condition does not change over the period under consideration.

Description

The gross teaching force at time t is $G_t = T_t + U_t \dots (1)$.

Suppose that a_{1t} and a_{2t} are respectively the proportion of trained and untrained teachers at time t , such that $a_{1t} + a_{2t} = 1$ (for all t). Out of $1(x_g)$ persons graduating into the teaching profession at age x_g , $1(x)$ persons survive up to age x . If $x - x_g = n$, $a_{1x-n} \cdot 1(x)$ is the number of trained teachers and $a_{2x-n} \cdot 1(x)$ the number of untrained teachers surviving at age x . As only a fraction $h_1(x)$ and $h_2(x)$ of living trained and untrained teachers respectively participate in teaching at age x , the numbers of trained and untrained teachers graduating at age x_g and participate in teaching up to age x are $h_1(x) \cdot a_{1x-n} \cdot 1(x)$ and $h_2(x) \cdot a_{2x-n} \cdot 1(x)$ respectively. Also,

$[h_1(x) \cdot a_{1x-n} + h_2(x) \cdot a_{2x-n}] \cdot 1(x)$ is the number of the teaching force graduating at age x_g and participating in teaching up to age x . Thus,

$$[h_1(x_g + n) \cdot a_{1x_g} + h_2(x_g + n) \cdot a_{2x_g}] \cdot \frac{1(x_g + n)}{1(x_g)} = \sigma(n) \dots (2)$$

may be interpreted as the fraction of the teachers participating in teaching n years after graduation into the sector.

The gross teaching force at time t , i.e. the stock of teachers at time t , is the function of all the teachers produced during the last $\theta = x_t - x_g$ years.

$$G_t = \sum_{y=0}^{\theta} a_{1t-y} \cdot h_1(x_g+y) \cdot \frac{1(x_g+y)}{1(x_g)} \cdot g(t-y) \\ + \sum a_{2t-y} \cdot h_2(x_g+y) \cdot \frac{1(x_g+y)}{1(x_g)} \cdot u(t-y) \dots (3)$$

Equation 3 gives the stock of teachers for the schooling sector under consideration at any time t.

The teachers' requirement at any time t is

$$G_t^1 = \mu \cdot E_t \quad \dots (4)$$

E_t encompasses the total enrolment in the sector at time t. Out of 1 (x_s) entrants at age x_s , $1(x_s+1)$ survive up to age (x_{s+1}). As only a fraction K_1 will continue in the succeeding class either due to screening or dropout, $K_1 \cdot 1(x_{s-1}+1)$ is the number of students in the succeeding class. Similarly, $K_2 \cdot 1(x_s+1)$ is the number of students in the next class and $K_1 \cdot K_2 \cdot K_{\lambda-1} \cdot 1(x_s+\lambda-1)$ is the number of students in the uppermost class of the educational sector under consideration. And $K_1 \cdot K_2 \dots K_{\lambda} \cdot \frac{1(x_s+\lambda)}{1(x_s)}$ is the fraction of the students entering the sector who will complete their education in that sector.

E_t , which may be considered as the stock of students in the sector at any time t, is the function of all the entrants during the last years. Thus

$$E_t = \gamma(t) + K_1 \cdot \gamma(t-1) \cdot \frac{1(x_s+1)}{1(x_s)} + K_1 \cdot K_2 \cdot \gamma(t-2) \cdot \frac{1(x_s+2)}{1(x_s)} + \dots \\ + \dots + K_1 \cdot K_2 \dots K_{\lambda-1} \cdot \gamma(t-\lambda+1) \cdot \frac{1(x_s+\lambda-1)}{1(x_s)} \dots (5)$$

From equations 4 and 5

$$G_t^1 = \mu [\gamma(t) + K_1 \cdot \gamma(t-1) \cdot \frac{1(x_s+1)}{1(x_s)} + K_1 \cdot K_2 \cdot \gamma(t-2) \cdot \frac{1(x_s+2)}{1(x_s)} + \dots \\ + \dots + K_1 \cdot K_2 \dots K_{\lambda-1} \cdot \gamma(t-\lambda+1) \cdot \frac{1(x_s+\lambda-1)}{1(x_s)}] \dots (6)$$

Equation 6 gives the demand of the teachers in the educational sector under consideration.

In order that teachers' requirement may agree with the stock of teachers produced, we must equate equation 3 and 6.

i.e. $G_t = G_t^1$

$$\text{i.e. } \sum_{y=0}^{\theta} a_{1t-y} \cdot h_1(x_g+y) \cdot \frac{1(x_g+y)}{1(x_g)} \cdot g(t-y) + \sum_{y=0}^{\theta} a_{2t-y} \cdot h_2(x_g+y) \cdot \frac{1(x_g+y)}{1(x_g)} \cdot u(t-y)$$

$$= \mu \left[\gamma(t) + \dots + K_1 K_2 \dots K_{\lambda-1} r(t-\lambda+1) \cdot \frac{1(x_s + \lambda - 1)}{1(x_s)} \right] \dots (7)$$

Equation 7 gives a balanced demand-supply model of teachers' requirement.

Equation 7, though a general model, is cumbersome. However, it may be simplified under some further assumptions. On the assumption that (a) no untrained teachers will graduate into the sector, (b) trained teachers will participate in teaching throughout their working life and (c) screening and dropout will occur at a constant rate $(1-k)$ in each of the classes of the sector, equation 7 becomes :

$$\sum_{y=0}^{\theta} \frac{1(x_g + y)}{1(x_g)} \cdot g(t-y) = \mu \cdot \sum_{z=0}^{\lambda-1} r(t-z) \cdot \frac{1(x_s + z)}{1(x_s)} \cdot K^z \dots (8)$$

Equation 8 seems to be a balanced demand-supply model of teachers' requirement, appropriate for the primary sector in the Indian context. Similarly, with some other assumptions relevant to the system, demand-supply models can be presented for secondary or other sectors of education.

The model given by equation 8 requires the estimation of parameters μ and K from the time series data. The $1(x)$'s are obtainable from the life table; $r(t)$ is also fixed *a priori* according to the importance of the sector and budgetary constraints. The key-variable $g(t)$ which is intended to determine how many teachers need be produced in the sector in future, is then obtainable from equation 8.

Conclusion

The model forecasts the demand for teachers in future, which, in a simplified form, is given below for successive years.

$$g(t+1) = \mu \cdot \sum_{z=0}^{\lambda-1} k^z \cdot r(t+1-z) \cdot \frac{1(x_s + z)}{1(x_s)} - \sum_{y=1}^{\theta+1} \frac{1(x_g + y)}{1(x_g)} \cdot g(t+1-y)$$

$$g(t+2) = \mu \cdot \sum_{z=0}^{\lambda-1} k^z \cdot r(t+2-z) \cdot \frac{1(x_s + z)}{1(x_s)} - \sum_{y=1}^{\theta+1} \frac{1(x_g + y)}{1(x_g)} \cdot g(t+2-y)$$

$$g(t+p) = \mu \cdot \sum_{z=0}^{\lambda-1} k^z \cdot r(t+p-z) \cdot \frac{1(x_s + z)}{1(x_s)} - \sum_{y=1}^{\theta+1} \frac{1(x_g + y)}{1(x_g)} \cdot g(t+p-y).$$

for $p=1, 2, \dots$

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Headmasters' Behaviour as Perceived by Teachers

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EDUCATIONAL institutions are established in accordance with the social, political, economic and cultural needs and aspirations of the community and the nation. The administration of these institutions is a complex phenomena involving various variables which directly or indirectly influence the aims and objectives, plans, policies, structure, organization, curriculum, methodology and effectiveness of the whole educational system. The major functions of administration are "to plan, to organize, to staff, to direct, to coordinate, to report and to budget" (POSDCORB), and finally to evaluate the achievements and successes of the end-product. It can be progressive and democratic, or conservative and authoritarian according to the aim, faith and philosophy cherished by the country and the administrators.

During the British rule in India, educational administration was conservative and authoritarian. With the growth of democratic ideas and ideologies, social and economic transformations, scientific inventions and technological innovations, 'supervision' came into existence, and is regarded as a modern democratic concept aimed at "the maximum development of the teacher into the most professionally efficient person he/she is capable of becoming". It is "associated with precepts respecting democratic human relationships and is based upon reason, practical intelligence and

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remedial measures". In short, administration can be the process which guides and controls the working of an organization with its components and constituent parts; organization as the set-up or unit, and supervision as the superior vision of the administrator for the betterment of the organization in all its aspects.

We should be aware of the variables that try to control and influence education. Because control of education "offers one promising opportunity to control the thoughts and destinies of the people in the community, state and nation". Various pressure-groups try to control the educational policies and programmes. The human variable like the headmaster and staff-members, students and their parents, community leaders and higher authorities are directly associated with education. Besides, the material resources available for the fulfilment of the community and national aspirations constitute another variable. The educational policies and programmes laid down by the State through its Constitution, legislatures and parliament form another variable. Of all these variables, the administrator, that is, the headmaster plays a vital role in determining the effectiveness and success of the whole programme. Upon his initiative and planning, the effectiveness of the institution and the efficiency of the staff-members depend. These are measured by the degree to which the resources—human and material—have been utilized and brought to bear upon the educational process. It is he who accepts the challenges of leadership in school situations. How does he go in for the effectiveness of the institution and efficiency of the staff? In other words, how does he behave in different school situations?

The Problem

The present study seeks to study how headmasters generally behave in normal school situations, because on that the effectiveness of the institution depends. They are branded 'good' or 'bad', 'autocratic' or 'democratic', 'conservative' or 'progressive', according to the way they plan, organize, direct and maintain the human relations between the administrators, staff and the students. This relationship or behaviour determine the success of the educational programme. Through this behaviour he marshalls all the resources at his disposal towards their fruitful utilization. This behaviour may be interpersonal or environmental. The interpersonal factors are his faiths, beliefs, attitudes, interests, abilities and intellectual qualities. The environmental factors are the community expectations—political as well as social needs and requirements. Therefore, how the headmasters actually behave in different school situations, specially with the teachers, has to be studied.

Significance of the Problem

This study is significant because in this country, no such study has yet described how headmasters actually behave in school situations with their teachers. Further, professional literatures are replete with how the headmasters ought to behave, instead of how they are *actually* behaving. Therefore, an understanding of the 'reality' of the situation, as it exists, is extremely essential to formulate proper training and evaluation of the educational administrators and headmasters who are generally regarded as leaders in school situations. Further, the appointment of headmasters by virtue of their seniority of service without adequate training or administrative experiences, has often resulted in chaos, embarrassing bickering among the staff and has been a problem for the authorities and the department. Besides, there is no systematic training programme, both inservice and preservice, for educational administrators in this country. The B.Ed. and M.Ed. programmes are too sketchy and theoretical. Therefore, this study seeks to study the behavioural patterns of the headmasters of secondary and higher secondary schools as they really exist.

The Sample

The sample consisted of experienced teachers of secondary and higher secondary schools of the northern region who attended the various inservice courses conducted by the Extension Services Centre of the Regional College, Ajmer, during 1968-1970. These respondents belonged to all the disciplines available in the schools of the region—science, commerce, agriculture, humanities and crafts. Their experiences vary from five to thirty years and they belonged to all grades and status. Moreover, they have served under more than one headmaster and have developed a general perception and a stable opinion of how headmasters generally behave in school situations.

Tools

All the respondents were provided with an open-ended questionnaire on the first day of their arrival. They were requested to "list out the behaviour of the headmaster/principal towards the teachers in general", that is, to mention the type of behaviour that they have experienced from their headmasters during their period of service. They were instructed not to keep any particular headmaster in view but to mention their general opinions about the ways the headmasters generally behave. These responses were

collected on the last day of the programme. As these inservice programmes had varied durations ranging from three to seven days, sufficient time was at the disposal of the teachers to think and answer properly. Out of the total 210 participants to whom the questionnaire was given, 203 (nearly 97 per cent) responded.

These responses were content-analyzed. No hypothesis was drawn at the beginning or at any stage of the study. It was meant only to understand if any major dimension would emerge—if so, what was that? Broadly speaking, it was intended to study the perception of the teachers towards the headmasters' behavioural patterns.

Findings

The following findings were drawn up after the content-analysis was made.

1. Two distinct categories of behaviours emerged. One broad category consisted of behaviours like communication-oriented, cooperative, constructive, permissive, production/outcome-oriented, and adaptable. On the other hand, behaviours like self-oriented, authoritarian, traditional, rejecting, apathetic and indifferent, emerged. These two broad categories have been put under
 - (a) Democratic and Progressive,
 - (b) Authoritarian and Conservative.
2. More than eighty per cent of the teachers stress that headmasters in general are
 - (a) less sympathetic regarding difficulties of the teachers;
 - (b) guided by their own norms, values and beliefs without considering those of others;
 - (c) partial in distributing remunerative responsibilities without any rationale like seniority or experience or capability;
 - (d) authoritarian, fault-finding, and condemning;
 - (e) desirous of maintaining the hierarchy, bureaucratic model of administration ("through proper channel") and rules and regulations;
 - (f) unable to develop the confidence, a sense of belonging, security, a sense of achievement and economic stability;
 - (g) desirous of restoring the old and traditional methods and ways, both academic and administrative, instead of resorting to the new methods or implementing new ideas and innovations;

HEADMASTERS' BEHAVIOUR AS PERCEIVED BY TEACHERS

- (h) emphatic in stressing the result of the school at the public examination without looking into the development of other aspects of the child;
 - (i) less cooperative in planning or teaching or policy-making or decision-making;
 - (j) traditional and conservative and like to go back to the good o'd days and maintain the *status quo*;
 - (k) poor and ambiguous in taking proper and timely decisions;
 - (l) keen in shifting the responsibility to other staff members, specially to the senior ones and shirk responsibilities (passing the buck).
3. On the other hand, the teachers
- (a) strongly depreciate groupism and favouritism fostered by headmasters; they are of the opinion that this is responsible for most of the evils from which the school suffers;
 - (b) feel that the headmasters who have not been clear about their functions tend to be confused as to their roles and are logically inconsistent in thought and action and somewhat autocratic;
 - (c) suggest that the popularity of the headmaster, the morale of the school as well as the staff, academic achievement of the students and the general efficiency of the school depend upon the proper understanding, sympathy, friendliness and respect on the part of the headmasters;
 - (d) are of the opinion that the effectiveness and reputation of the school as well as efficiency of the staff depend upon how headmasters marshall the resources of the school, democratically through group-work, group-planning, group-decisions and group-implementation of the various plans and programmes;
 - (e) are of the opinion that better headmasters are not hypercritical towards their subordinates and have faith in their abilities; they are the more permissive, cooperating and constructive instead of being condemning, rejecting and traditional.
4. It has been found from the answers of the teachers that headmasters who are conservative and traditional are also more authoritarian in their behaviours; on the other hand, democratic and progressive headmasters are more cooperative and constructive in their day-to-day behaviour.
5. According to the teachers, the headmasters and principals should

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- (a) develop better understanding of human relations specially regarding their staff-members;
- (b) understand democratic procedures in planning and executing the policy and programmes of the school in cooperation with the staff and parents;
- (c) not to be tied down to the departmental rules and regulations rigidly but be flexible and adaptable in their approaches; they should not utilize the rules and regulations to harass any staff member.
- (d) devote 90 per cent of their time for instructional purposes, supervision of the classes, guiding teachers, discussion of crucial issues regarding the school and undertaking new experiments and innovations.

This study is expected to have some impact on the educational process in spite of the fact that this is just a preliminary one. It may help us understand the reality of the headmasters' behaviour as they exist in schools at present. This may help to draw up proper improvement plans, training programmes and evaluation techniques for the future educational administrators.

This study is extremely limited in its scope—only to understand the headmasters' behaviour in actual school situations, and to categorize them. The advent of "behavioural science" and its impact on different disciplines have brought about important changes. It is, therefore, imperative that more studies should be conducted in this field, since the connotation of the word "administration" has emphasized the *process* and not a conglomeration of traits (capabilities, leadership, human relations). The institution as an 'organism', as a whole unit, has been accepted along with the behavioural concept of administration in recent years. Such studies in large numbers would help to understand what educational administration is and the theory lying behind it. Only then a solid foundation can be laid for training suitable educational administrators, and educational administration can be developed as a full-fledged discipline at par with business administration and public administration.

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Teaching Attitude as A Determinant for Classroom Verbal Interaction

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RESEARCH on teaching has long been conducted from outside the classroom and therefore the *actual* classroom behaviour of teachers has not been studied. So the concept of teaching remains vague and classroom teaching remains ineffective in most of our schools.

Research on teacher behaviour has now become significant to educators and educational policy-makers. In our country, except at the CASE, Baroda, no systematic attempt has been made to study various aspects of teacher behaviour. A review of literature indicates that many research studies have been conducted by classroom ratings for teacher behaviour. But the findings have been inconsistent and suggest that teacher behaviour is dependent upon various factors. The classroom ratings have been highly subjective.

Ned A. Flanders' Interaction Analysis Technique for studying the chain of classroom events is an objective and comprehensive device. The inferences based on this technique have greater degree of certainty and consistency. Thus, the present study is an attempt to investigate the relationship between teaching attitude and classroom verbal behaviour of teachers.

TEACHING ATTITUDE IS SIGNIFICANT
FOR TEACHER BEHAVIOUR

D. G. Ryans conducted an extensive research on teachers. He concluded that teachers with high observer rating as compared to those of low rating had in general a tendency to be more generous in their appraisal of behaviour and motives of their students, prefer permissive classroom atmosphere and enjoy pupil^{*} relationship.

Davidson and Lang¹ found that teacher's feelings and attitudes are communicated both verbally and non-verbally to the child.

Flanders² found that most constructive and independent attitudes were associated with the indirect pattern of teacher influence. Indirect teachers were found to be more alert regarding the student's statements than the direct teachers and they accepted and clarified the students' ideas to a greater extent.

A.S. Barr³ (1934) concluded that attitude towards teaching is significantly associated with teaching ability.

The study⁴ shows that Hong Kong students react to the MTAI as much as the British and American students do.

The review of literature in the area of teacher behaviour in classroom reveals that teaching attitude of a teacher appears to be significant for classroom verbal interaction.

Objectives

The study was conditioned by the following objectives:

- to estimate the extent of relationship between verbal behaviour and attitude towards teaching;
- to test the statistical significance of the relationship between verbal behaviour of teachers and their teaching attitude;
- to analyze the relationship of teaching attitude and verbal behaviour with reference to language, science-maths and social studies teachers;
- to estimate the extent of relationship between teaching attitude and verbal behaviour with regard to teaching classes;
- to ascertain the relationship between teaching attitude and pooled ten interaction variables;
- to identify the patterns of verbal behaviour in terms of flow of interaction models associated with high and low attitudes of teachers.

¹ Paul, M. Allen, *et al.*, *Teacher self-appraisal—A way of looking over shoulders*, Charles and Jones Publishing Company, Washington, Ohio, 1970, p. 78

² *Ibid.*

³ *Review of Educational Research*, Vol. X, 1940, pp. 185-190

⁴ *Educational Research Journal*, Vol. XV, No. 1, 1969, pp. 62-63

Hypotheses

For the underlying plan and procedure of the study, the following hypotheses were tested :

- There is significant relationship between the verbal behaviour and teaching attitude.
- Callis (1954) found that the MTAI scores, were correlated significantly with classroom ratings by observers⁶.
- There is a significant positive correlation between indirect influence of teacher and teaching attitude.
- Amidon and Flanders⁶ found that achievement among students was higher in the most indirect classroom behaviour of teacher.
- There is negative relationship between direct influence and teaching attitude.
- Perkins⁷ found that teacher lecturing and criticism were related to the pupils' loss in reading comprehension scores.
- There is a positive relationship between the pupil talk and teaching attitude.
- The pupil initiation ratio is positively related to the teaching attitude.
- Amidon and Giammates⁸ concluded that the administrator selected 'superior-teachers' who accepted the students' ideas, dominated their classroom less, asked broader questions, used more praise and allowed more student participation.
- Teacher response and teacher-question ratios and instantaneous teacher-response and question-ratios are positively related with teaching attitude.
- Content cross-ratio, vicious circle, silence-confusion, steady-state ratio and pupil-steady-state ratio are negatively related with teaching attitude.

Method

The study was conducted by employing normative survey method. The normative survey testing and observation was done for administering the MTAI scale and for encoding the classroom interaction. The adapted Minnesota Teacher Attitude Inventory (MTAI) in Hindi was used for measuring teaching attitude. The test-retest reliability was obtained to be 0.892. The split-half reliability of the MTAI scale was reported 0.909. The

⁶The Journal of Experimental Education, Vol. XXXVIII, No. 1, Fall 1969, p. 47

⁶Paul, *op. cit.*, p. 78

⁷Ibid.

⁸Ibid., p. 78

validity coefficients inventory versus personality rating and classroom rating were found to be 0.480 and 0.460 respectively. The coefficient of multitrait validity was obtained to be 0.543. It appears that the adapted scale is reliable and valid.

Flanders' Ten Category System (FIAC) was used for classroom verbal interaction. The observers recorded the number of categories fitting the behaviour going on during each three-second intervals in the classroom. This yielded a list of category numbers representing the verbal behaviour. The two trained observers completed the encoding work of classroom interaction. The observer's reliability was computed by Scott's formula. They maintained 89 per cent level of agreement. It was higher than 70 per cent acceptable index. It seems that the data obtained for verbal behaviours are reliable.

Sampling

A sample of five hundred B.Ed. students (250 male and 250 female) was selected by Cluster Sampling Technique from five training colleges: Meerut College, Meerut; N.A.S. College, Meerut; N.R.E.C. College, Khurja; K.V. College, Machhra (Meerut), and D.W.T. College, Dehradun, of Meerut University, in 1972-73. The raters observed 220 languages, 154 social studies and 126 science-maths lessons of the student-teachers. All the pupil-teachers taught their lessons through question-answer method, but other variables such as academic qualifications, recency of training and knowledge of theory and practice were not controlled. The point biserial correlation was applied in the dichotomy of 27 per cent top and 27 per cent bottom groups of the sample on the basis of MTAI scores. Thus 135 student teachers were obtained in each group.

The clockwise flow of classroom interaction and box flow diagram presentation and interpretation of five top and five bottom extreme cases were attempted to analyze the nature and structure of verbal interaction. The MTAI scores were considered as a criterion for selecting these 10 cases out of 500 cases of the total sample.

Results

The analysis was done by Pearson's Product Moment Correlation for ascertaining the relationship with ten interaction categories, behaviour ratios and interaction variables. The eta correlation was used for compensating the non-linearity of the bi-variate distributions. The point biserial correlation was used in the dichotomy of 27 per cent top and 27 per cent

bottom cases of the sample. The significance of relationship of various measures was also tested by employing the tests of the significance. The obtained results have been summarized in Table 1.

TABLE 1
COEFFICIENTS OF CORRELATION, ETA CORRELATION AND POINT
BISERIAL CORRELATION BETWEEN MTAI SCORES AND
INTERACTION CATEGORIES

Categories (FIAC)	Pearson's Correlation : Eta Correlation				Point Biserial r_{pbis}
	r	t	n	F	
1 Accepts feelings	0.360	8.635**	0.409	14.31**	0.640**
2 Praises or Encourages	0.226	6.124	0.289	6.43**	0.404**
3 Accepts or Uses Ideas of Pupils	0.619	17.158**	0.728	58.68**	0.398**
4 Asks Questions	0.329	7.745**	0.379	11.859	0.685**
5 Lecturing	-0.493	12.632**	0.519	25.92**	-0.161
6 Giving Directions	0.353	8.824**	0.356	10.25**	0.456**
7 Criticizing or Justifying Authority	-0.120	4.078**	0.422	15.15**	0.059
8 Pupil-talk	0.211	5.213**	0.507	24.31**	0.114
9 Pupil Initiation	0.401	9.654**	0.463	19.23**	0.588**
10 Silence or Confusion	-0.503	12.929**	0.506	24.26**	-0.044
Size of Sample	500		500		270

* .05, ** .01 level of significance.

Table 1 indicates that the highest and significant coefficient of correlation was 0.619 ($t=17.158$) for category 3 (accepts feelings and uses ideas). The lowest but significant correlation coefficient was 0.120 ($t=4.078$) for category 7 and eta coefficient 0.356 ($F=10.25$) for category 6. The eta coefficient and coefficient of correlation yielded consistent results. It may be stated that categories 1, 2, 3, 4, 6, 8 and 9 appear to be significantly related with teaching attitude. The categories 5, 7 and 10 seem to be negatively associated with the MTAI scores. The first seven categories were also analyzed exclusively and the similar results were obtained.

The highest and significant point biserial correlation was found to be 0.685 for category 4 and lowest -0.044 for category 10, but not significant. It may be interpreted that categories 1, 2, 3, 4, 6 and 9 appear to differentiate in positive direction of attitude scores and category 5 differentiates

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in negative direction. Categories 7, 8 and 10 may not differentiate between top and bottom groups.

The similar analysis was attempted for behaviour ratios and the MTAI scores. The Pearson's coefficients of correlation, eta correlations, point biserial correlations and their significance have been provided in Table 2.

TABLE 2
COEFFICIENTS OF CORRELATION, ETA CORRELATION AND POINT
BISERIAL CORRELATION BETWEEN MTAI SCORES AND
BEHAVIOUR RATIOS

Behaviour Ratios	Pearson's Correlation: Eta Correlation				Point Biserial Correlation r_{pbis}
	r	t	n	F	
1 Teacher-Talk	0.052	1.139	0.096	0.66	0.019
2 Indirect Teacher-Talk	0.352	8.425**	0.385	12.22**	0.707**
3 Direct Teacher-Talk	-0.511	13.286**	0.524	26.62**	-0.655**
4 Pupil-Talk	0.514	13.364**	0.519	26.03**	0.716**
5 Silence or Confusion	-0.503	12.929**	0.506	24.26**	-0.095
6 Indirect to Direct Ratio	0.654	19.500**	0.674	58.40**	0.656**
7 Pupil Initiation Ratio	0.324	7.625**	0.379	11.76**	0.376**
8 Teacher Response Ratio	0.529	13.916**	0.545	29.72**	0.290**
9 Teacher Question Ratio	0.516	13.416**	0.524	26.69**	0.654**
10 Content Cross Ratio	-0.380	9.136**	0.420	13.57**	-0.485**
11 Vicious Circle	-0.526	13.837**	0.535	28.56**	-0.343**
12 Pupil Steady State Ratio	-0.440	11.055**	0.465	19.46**	-0.535**
13 Instantaneous Teacher Response Ratio	0.489	12.425**	0.545	23.83**	0.561**
14 Instantaneous Teacher Question Ratio	0.342	8.135**	0.403	13.64**	0.550**
15 Steady State Ratio	-0.329	7.770**	0.401	13.47**	-0.318**

Table 2 reveals that significant and highest correlation was found to be 0.689 ($t=21.105$) for indirect influence and eta correlation 0.674 ($F=58.40$) for indirect-to-direct ratio and lowest coefficient correlation was 0.052 ($t=1.139$) and eta coefficient 0.096 ($F=0.019$) for teacher-talk.

It may be stated on the basis of analysis that indirect influence, pupil-talk, indirect-to-direct ratio, pupil-initiation ratio, teacher-response and question ratios, instantaneous teacher-response and question ratios appear to be significantly related to teaching attitude in male and female teaching subjects and teaching classes. It may be further stated that direct influence, silence or confusion, content cross ratio, vicious circle, steady state ratio and

pupil steady-state ratio seem to be significantly and negatively associated with attitude towards teaching, but the results were not consistent for ninth grade.

The highest and significant point biserial correlation was to be 0.71 for pupil-talk and the lowest 0.019 for teacher talk.

It may be stated that indirect influence, pupil-talk, pupil-initiation ratio indirect-to-direct ratio, teacher-response ratio, teacher question ratio, instantaneous teacher-response and question ratios seem to differentiate the top and bottom groups in positive direction. The direct influence, content cross ratio, vicious circle, steady state ratio, pupil steady state ratio differentiate in negative direction.

The relationship between interaction variables and MTAI scores was also attempted and the obtained results have been summarized in Table 3.

TABLE 3
COEFFICIENTS OF CORRELATION, POINT-BISERIAL CORRELATION
BETWEEN MTAI SCORES AND INTERACTION VARIABLES

Interaction Variables	Pearson's Correlation		Point Biserial Correlation	
	'r'	't'	r _{pbis}	't'
1 Indirectness i/i+d	0.458	11.732**	0.607	9.92**
2 Sustained acceptance (3-3) cell	0.392	9.567**	0.771	13.12**
3 Indirect Influence Col. 1, 2, 3 & 4	0.352	8.425*	0.707	15.88**
4 Questions Col. 4	0.329	7.745**	0.685	20.56**
5 Teacher-Talk Col. 1-7	0.052	1.139	0.019	0.33
6 Restrictiveness Col. 6-7	-0.519	13.372**	-0.582	9.43**
7 Restrictive feedback (8-6)+(8-7)+(9-6)+(9-7) Cell	-0.367	8.489**	-0.791	14.84**
8 Negative authority	-0.572	14.628**	-0.683	11.00**
9 Praise Col. 2	0.226	6.124**	0.404	11.00**
10 Flexibility high i/d—low i/d	0.465	11.916**	0.480	7.63**
Sample Size	500		270	

It may be gathered from Table 3 that the highest and significant coefficient of correlation was obtained to be 0.465 for flexibility and the lowest 0.052 for teacher-talk but not significant.

It may be stated that the indirectness, sustained acceptance, questions, indirect influence, praise and flexibility appear to be significantly and positively related to teaching attitude in male, female, languages, social studies, science-maths and teaching classes. It may be inferred that the restrictiveness, restrictive feedback and negative authority seem to be significantly and

negatively associated with teaching attitude, in male and female teaching subjects and grade levels.

The highest and negative (-0.791) point biserial correlation was found for restrictive feedback and the lowest for teacher-talk. It may be interpreted that indirectness, sustained acceptance, indirect influence, questions, praise and flexibility seem to differentiate the extreme groups in positive direction. The restrictiveness, restrictive feedback and negative authority also appear to differentiate but in negative direction. These findings bear out that the hypotheses that teaching attitude is a valuable characteristic of verbal interaction in the classroom.

The multiple correlation was found to be 0.529 between the MTAI scores and pooled ten interaction variables.

The 'F' value for the coefficient of multiple correlation was obtained to be 18.46 with 10.489 degrees of freedom. It may be concluded that the teaching attitude is significantly related with the interaction variables.

These findings may not be helpful for understanding the flow of interaction patterns. Therefore, the analysis of flow of interaction was also made to highlight the findings of the study. This analysis was attempted for five top and five bottom cases individually and in two combined matrices.

The interaction models of critical teaching behaviours were also located from the flow of interaction analysis. *Model First*: high content emphasis under close teacher direction, *Model Second*: teacher directed quick drill, *Model Third*: drill combined with lecture demonstration and *Model Fourth*: teacher gives direction with some clarification, may be best located from the low group teachers' and also from the top group teachers' flow of interaction. The models involving more student thought. *Model Fifth*: stimulating independent student thought. *Model Sixth*: attending to student feelings, and *Model Seventh*: teachers' transitions from the affective to an intellectual emphasis may be located mainly from the top group teachers' flow of interaction.

Findings

The following conclusions may be formulated in consonance with the results obtained:

- It appears that there is significant relationship between teaching attitude and verbal interaction of teachers.
- Flanders' categories—accept feelings, praise or encourage, accept feelings and use students' ideas, ask questions, pupil-talk and pupil-

- initiation, i.e. Categories 1, 2, 3, 4, 8 and 9—seem to be positively related with the teaching attitude.
- It appears that categories—lecturing, criticizing and justifying authority and silence/confusion, i.e. categories 5 and 7 and 10—seem to be negatively related with teaching attitude.
 - It seems that indirect influence, indirect-to-direct ratio, pupil-talk, pupil-initiation ratio, teacher response and question ratio, instantaneous teacher response and question ratio are positively related with teaching attitude.
 - It appears that direct influence, silence/confusion, content cross ratio, vicious circle, steady state ratio and pupil steady state ratio are negatively related with teaching attitude.
 - It seems that indirectness, sustained acceptance, indirect influence, question, praise and flexibility are related with teaching attitude.
 - It appears that restrictiveness, restrictive feedback and negative authority are negatively associated with teaching attitude.
 - It may be inferred that teacher talk is not related with teaching attitude.
 - It appears that teachers having high attitude show the interaction models involving more student initiation and the teachers having low attitude show the interaction models involving more teacher participation.

In conclusion, it may be stated that this study describes a procedure that can be applied to researches on one aspect of teacher effectiveness and the delineation of the facts related to improving classroom teaching. The findings may be an addition to the area of teaching technology.

In the opinion of the researcher, the findings have implications for teacher-education in the area of selection of teachers for training programme. The teachers having high positive attitude towards teaching appear to be fully involved in classroom teaching. The findings suggest that teacher-education programme should help the students to develop positive attitude towards teaching and to acquire the skills of presenting and selling their ideas for improving the quality of teacher education programme by emphasizing the affective and psychomotor activities.

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Effect of Constructed and Discriminant Response Modes in a Linear Programme for Teaching Geography to Class VIII Children

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To study the effects of constructed and discriminant response modes in a linear programme for teaching geography, a group of 60 boys of Class VIII has been divided into two sub-groups, parallel in respect of intelligence. The results showed : (a) There was no significant difference in the effectiveness of constructed and discriminant response modes in a linear programme; (b) the subjects of average and above-average intelligence levels were equally benefited by the programmed material, but the performance of the below-average intelligence group was significantly lower than the former groups; (c) the response modes interacted with the intelligence levels significantly.

A NUMBER of studies have compared multiple choice response modes with constructed ones. Marshall and Grossberg (1961)¹ and Roe and others (1960)² compared the two response modes for linear programmes in science and maths. Regarding their effectiveness, no significant difference was

¹Shah, G.B. "Response Modes in Programmed Learning : An Over-view." Patel and Others, "A Handbook of Programmed Learning," Baroda : CASE, 1972, p. 60

²*Ibid.*, p. 64

found in any of these studies. Fry (1960)³ tested the same for Spanish words and phrases and found that constructed condition was superior to multiple-choice condition. It shows that perhaps the content variable plays an important role in the effectiveness of the two response modes in the linear programme. In the present study, linear programme on a topic of physical geography (rocks) has been used for the investigation. The study includes a subject variable also.

The main purpose of the study was to test the effectiveness of constructed and discriminant response modes on various intelligence levels.

The following null hypotheses were formed for testing :

- Programmed material with constructed response modes is as effective as it is with discriminant response mode;
- The programmed material is found uniformly effective for different intelligence levels;
- and the two modes of response are independent of intelligence levels regarding their effectiveness.

METHODS

Design : In the experiment a plan of 2×3 factorial design with two factors, namely, programme forms and intelligence levels was followed. The first factor was studied at two levels, viz. a linear programme with constructed response mode (form C) and a linear programme with discriminant response mode (form D). The second factor was studied at three levels, viz. above 110 (I_1), between 110 and 90 (I_2) and below 90 (I_3). The dependent variable of the study was attainment scores as measured by the criterion test.

Sample : A group of 180 boys of Class VIII was taken from an institution located in an urban setting and they were tested for general intelligence. A sample of 60 boys taking 20 from each level of intelligence was selected from the group. The sample was divided into two parallel groups: A and B according to intelligence levels. Each group consisted of 30 pupils. The composition of the group was such that 10 subjects belonged to each intelligence level in a group. The ages of the pupils participating in the experiment ranged from 11 to 15 years with mode at 12 years.

Tools : The following tools have been used in the study.

- (a) Programme : In the study two forms of a linear programme were used. Both forms were developed on the same content, viz. "rocks". The content covered introductory concepts, viz. igneous rocks, sedimentary rocks and metamorphic rocks.

³*Ibid.*, p. 60

- (a. 1) The constructed response mode form of the programme : It consisted of 119 frames distributed over different stages such as introduction (9 per cent frames), teaching (72 per cent frames) and review and testing (19 per cent frames). The percentage of the frames devoted to knowledge and skill was 78 and 22 approximately. The mean error-rate of the programme form was found to be 1.99 which is much below five. The mean density (Green, E. J.)⁴ of the programme form as measured by the ratio of the numbers of different frames to the total frames was found to be .30 which tells that 30 new ideas were released through every 100 frames.
- (a. 2) The discriminant response mode form of the programme : It consisted of 119 frames distributed over introduction, teaching and review and testing in 9, 72 and 19 per cent respectively. The percentage of the frames devoted to knowledge and skill was 78 and 22 respectively. The mean error, i.e. the rate of the programme was found to be 1.99. The over-all density (Green, E. J.) of the programme was found to be .30.
- (b) Criterion Test : The criterion test consisted of 20 test items, 14 multiple-choice and 6 recall-type. The split-half reliability coefficient when computed by Stanley's simplified method came out to be .93. The value is more than the acceptable level of reliability, viz. .90 (Ebel, 1969).
- (c) Intelligence Test: Samanya-Buddhi-Parikshan (General Intelligence Test) prepared by Prayag Metha was used to determine different intelligence levels according to the I.Q's of the subjects.

Procedure : An intelligence test was administered to a group of Class VIII boys of an institution located in an urban setting. The test papers were scored. The subjects within the group were organized in an ascending order of their intelligence scores. All the subjects having even ranks were taken in group A and those having odd ranks were put in group B. Thus, two parallel groups were formed.

Group A was taught by the constructed response form (form C) and group B by the discriminant response form (form D). During instructions, the students were required to produce responses on the sheets supplied to them.

The instructional programme lasted three days at the rate of 45-minute period per day. After the completion of the programme by both groups,

⁴Green, E.J. *The Learning Process and Programmed Instruction*, New York : Holt, Rinehart and Winston, Inc., 1962, p. 165

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the criterion test was administered. The test was scored and the obtained scores were subjected to the statistical computations.

RESULTS

For the analysis of the data, measures of central tendency and analysis of variance followed by t-test were employed. The means and standard deviations of the scores obtained by all the sub-groups have been recorded in Table 1.

TABLE 1
MEANS AND STANDARD DEVIATIONS FOR
DIFFERENT INTELLIGENCE LEVELS

S.No.	Programme Form	Intelligence Levels							
		Above 110 (I ₁)		Between 110-50 (I ₂)		Below 50		Total	
		Mu	S.D.	Mu	S.D.	Mu	S.D.	Mu	S.D.
1.	Constructed Response Mode-C	18.9	1.8	17.7	2.2	17.3	2.2	18.0	2.1
2.	Discriminant Response Mode-D	16.1	2.2	19.5	1.4	14.9	1.8	17.5	2.6

The data have been further subjected to two-way analysis of variance. The summary of the results has been provided in Table 2.

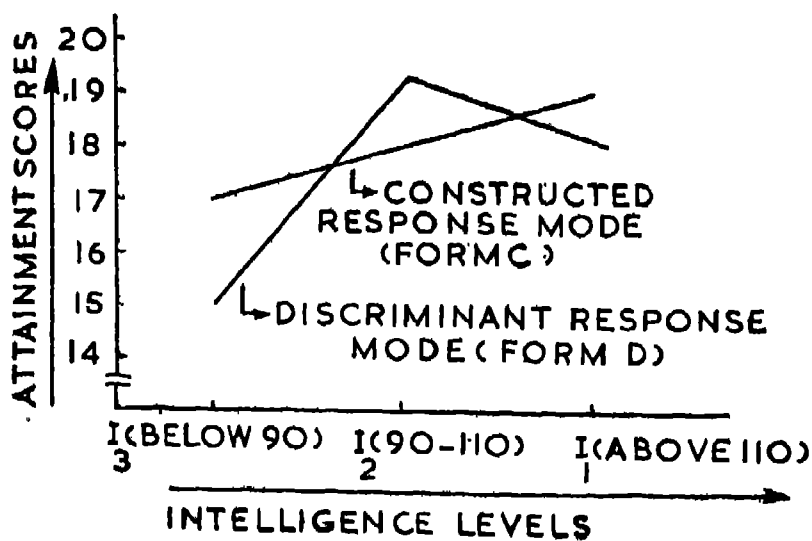
TABLE 2
SUMMARY OF ANALYSIS OF VARIANCE

S.No.	Sources	D.C.	S.S.	M.S.S.	F-ratio
1.	Response Modes (R)	1	2.81	2.81	00.49
2.	Intelligence Level (I)	2	69.03	34.51	06.01
3.	Interaction (I × R)	2	36.64	18.32	03.19
4.	Error	54	309.70	5.74	

The table presents that the F-ratio for the difference in the mean performances of the groups taught by form C and D is .49 which is not found to be significant even at .05 level of confidence. The observed difference in the mean performances may be attributed to chance alone and the two forms of the programme may be considered equally effective.

The F-ratio for the difference of means of three intelligence levels was found to be significant at .01 level of confidence. The result tells that the three groups regarding intelligence are not identical with respect to their performances. It has been explored further with the help of t-test. The results of t-ratio have been separately recorded in Table 3.

The F-ratio for the interaction between intelligence levels and the programme forms was found marginally significant at .05 level of confidence. The result shows that intelligence levels are not independent of programme forms and, therefore, two forms work differently for different intelligence levels. In order to explore the mode of interaction further, a graphical representation has been attempted and shown in the figure below.



The graph shows that with programme form C, the I_3 group scored the lowest among the subjects taught by the same form. The mean performance gradually increases with the increase in the average level of intelligence of the group. Form D follows a different pattern of performance. Here I_3 group showed lower average performance than the one that was taught by

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form C. The I_2 group exposed to form D scored far more than the corresponding I_2 group exposed to form C, whereas I_1 group exposed to the former performed lower than the one exposed to the latter. On the whole for I_2 group and I_1 group, form C worked better than form D. But for I_2 group, form D was found more effective than form C.

The following F-ratios for the intelligence factor, the values of t-ratios for different pairs of intelligence groups have been computed and recorded in Table 3.

TABLE 3
T-RATIOS FOR DIFFERENT PAIRS OF
INTELLIGENCE GROUPS

S.No.	Pairs of Intelligence Groups	Difference of Means	S.E	d.f.	t-ratio
1.	I_2 and I_3	2.50	0.81	38	3.10
2.	I_1 and I_2	2.40	0.81	38	2.96
3.	I_1 and I_3	0.10	0.63	38	0.16

The table shows that the t-ratio for the difference of means of I_1 and I_2 groups is found to be significant at .01 level of confidence. The examination of the means of the two groups tells that I_2 group shows higher performance than I_1 group.

The t-ratio for the difference of means of I_1 and I_3 groups was found to be significant at .01 level of confidence. On examination of the means of the two groups it becomes obvious that I_1 group shows higher performance than I_3 group.

The t-ratio for the difference in means of I_1 and I_2 groups was not found significant even at .05 level of confidence. It may be inferred from the findings that the mean performance of I_1 and I_2 groups was equal.

DISCUSSION AND SUMMARY OF FINDINGS

The experiment provides sufficient basis to believe that a linear programme with constructed mode of response works as well as it works with discriminant mode of response for all levels of subjects regarding intelligence. The result of the present study regarding the efficacy of the response-modes is supported by the results of the studies by Marshall and Grossberg (1961) and Roe and others (1960) although in both the studies the content was from science and mathematics. Thus it may be inferred

that the two response-modes work equally effectively with linear programme in science, mathematics and physical geography too.

The study provides evidence that the subjects possessing an intelligence level more than 110 (I.Q.) and between 110 and 90 were equal on the level of performance. It seems that the subjects possessing an I.Q. 90 or more may be equally benefited by a linear programme. Here it is pertinent to mention that subjects of lower intelligence took more time than the subjects of higher intelligence.

The study provides sufficient evidence to infer that subjects possessing an I.Q. below 90 could not attain the level of performance attained by the subjects possessing an I.Q. 90 and above. No amount of time could compensate for this extent of difference in intelligence.

It may be inferred that the response mode shows significant interaction with intelligence levels. Subjects possessing high intelligence (above 110) performed better than those possessing average (90-110) and low (below 90) intelligence, when taught by the programme with constructed response mode. But, when the programme with discriminant response mode was used, subjects of average intelligence (90-110) performed higher than those of high (above 110) and low (below 90) intelligence.

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Four Traditional Professions

A Comparative Study

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Professions by and large meet the social cause and serve the society through various skills. How these professions are held in public mind? What type of images do they build and how do they vary in terms of images, are some of the major concerns of this study. Based upon the semantic differential technique, a special instrument was designed and used to cover up four aspects of each of the four traditional professions. In all, 16 concepts and 16 scales were used in the study. The data was collected from 20 young men falling within the age range of 25-36 years. They all belonged to the same organization and had similar educational background.

The study reveals that there is a lot of variation in the psychological images in respect of various traditional professions. Considerably high score for all professions on intelligence factor show that the traditional professions have good intellectual tradition. However, the teacher was found to be least intelligent, skilled and efficient of all professions and the lawyer most intelligent; and the doctor most skilled. While the engineer is least patriotic, the doctor is most patriotic. On the dimension of character, the teacher has the highest score and the lawyer the lowest. Certain psychological distance was also found to exist between various professions. The highest distance was discovered between education and offence, and the least distance between technology and education, and between the student and the client.

INTRODUCTION

INDUSTRIAL sociologists generally advocate two models of professions—trait model and functionalist model (Johnson, 1972). Those who advocate trait model define professional behaviour in terms of essential attributes. Barber (1963) has identified four attributes : (1) A high degree of generalized and systematic knowledge; (2) Primary orientation to the community interest rather than to individual self-interest; (3) A high degree of self-control of behaviour through the codes of ethics internalized in the process of work socialization and through voluntary associations organized and operated by the work specialists themselves, and (4) A system of rewards that is primarily a set of symbols of work achievements and thus ends in themselves, not means to some end of individual self-interest. Johnson (1972) summarizes various attributes of profession as: (1) Skill based on theoretical knowledge; (2) the provision of training and education; (3) testing the competence of members; (4) organization; (5) adherence to a professional code of conduct, and (6) altruistic service. Trait approach actually conceives of an ideal type and we can evaluate a profession by judging against these criteria.

Advocating functionalist approach Wilensky (1964) has traced the history of professionalism in the United States of America. It consisted of five stages : (1) The emergence of of a full-time occupation ; (2) The establishment of a training school ; (3) The founding of a professional association; (4) Political agitation directed towards the Protection of the association by law, and (5) The adoption of a formal code. Caplow (1954) outlines a different sequence: (1) The establishment of a professional association ; (2) Change in the name of occupation ; (3) Development of a code of ethics; (4) Prolonged political agitation to obtain the support of public power, and (5) The concurrent development of training facilities.

Parsons (1968) advocates functionalist model. He observes that the boundaries of the group system we generally call the professions are fluid and indistinct. He identifies three core criteria of professionalism : (1) Formal technical training accompanied by some institutionalized mode of revalidating both the adequacy of the training and the competence of trained individuals. Among other things, the training must lead to some order of mastery of a generalized cultural tradition ; (2) Skills to be developed to master cultural tradition and use it, and (3) Profession must have some institutional means of making sure that competence would be put to socially responsible use.

Goode (1960) has claimed that if one extracts from the most commonly cited definitions all the items which characterize a profession, a commendable unanimity is disclosed and the differences are only of omissions. Similar observation is made by Ben-David (1963) who finds existence of

vocational culture. Professional sub-culture and other professional characteristics emerge on the basis of prolonged study and training in certain field and can be maintained by research activity, professional literature, legislation, etc. As Parsons (1968) also feels the profession depends on the notion of the university as the institution of the intellectual. University provides both training and intellectual tradition, and in some measure incorporates the legitimating structure of authority and competence (Jackson, 1970).

Turner and Hodge (1970) find it difficult to accept any distinction between occupation and profession because all occupations develop a culture, a terminology, a set of rules of craft, learning modes and dispositions. Many develop protective associations or guilds, organized associations or trade unions which act to institutionalize a given position in the occupational structure. Any occupation when struggling to maintain a monopolistic position would be trying to attain professional status (Johnson, 1972).

McKee (1970) observes, "If professions serve society expertly, they do so by converting the value-laden and ideological issues of one time into the technical problems of another," and illustrates his point by giving an example of a charismatic labour leader of yester-years who has not been replaced by the professional negotiator and arbitrator. McKee's observation actually illustrates the role of specialization and intensive training and skill in professionalization.

Profession in its modern context is an alien concept to India. In the ancient times we had professionals who hereditarily acquired skill through training from teachers. Their main objective was philanthropy. History of modern professions in India has been different from what was in the West. The Britishers first started practising in India, followed by the Indians trained in Britain. Gradually the professions of medicine and law came to be regulated through legislation. There are several occupations which have associations, university training programmes and intellectual tradition but there is no legislation to protect the interest of the practitioners and give them official recognition. Let us examine the profession of psychology. Teaching of psychology began in India over 70 years ago and professional organization exists since 1925. Training of clinical psychologist began in 1956. Psychologists are employed in all major government organizations including hospitals. But even today there is no statutory regulation giving psychologist an official recognition but company secretary has official sanction even without having any intellectual tradition. Training intellectual tradition, and code of professional ethics may not be enough in the absence of statutory regulations. For any profession emergence of a sub-culture, formal technical training, intellectual tradition and some institutional means to regulate practitioner's behaviour are important. Either trait or functionalist model alone is not enough to examine any profession. One

has to look for the history of the profession and then put it to the trait test of ideal profession. Today the state seems to play a major role in recognition of any profession.

The manner in which certain occupations are fast trying to achieve professional status, profession is becoming a status symbol. While certain new professions are emerging, conventional professions are also undergoing changes. Even the four traditional professions, i.e. medicine, teaching, engineering and law have undergone considerable change not only in terms of status but also in terms of prestige. Public attitude has been greatly affected by the attitude and behaviour of practitioners. These basically noble professions, today, have varied psychological images in public mind. It would be interesting to measure psychological images these professions have in public mind. The estimate of psychological distances and meaning profiles of these professions could probably help us in image-building of the traditional professions.

A profession has a *discipline*, a *practitioner*, an *objective*, and a *client system*. The discipline is actually the body of knowledge of the profession and its intellectual tradition or its sub-culture. *Practitioner* is actually the image-builder of a profession. All professions have a social objective to help a client with expert knowledge available with the practitioner of a profession. In this way, a profession has the following four main aspects:

ASPECTS OF FOUR TRADITIONAL PROFESSIONS

Aspects Professions →	Medicine	Engineering	Teaching	Law
↓				
Discipline	Medicine	Technology	Education	Justice
Practitioner	Doctor	Engineer	Teacher	Lawyer
Objective	Sickness	Construction	Enlightenment	Offence
Beneficiary	Patient	Client Organization	Student	Client

The aim of the present study is to measure the psychological distance between the four traditional professions using a specialized semantic differential instrument. Such a study will help us in not only quantifying the affective tone attached to these professions but also we can statistically find out psychological distances between these professions.

METHOD

(i) *Concepts* : Based on four aspects of four traditional professions, 16 concepts were chosen. These concepts represented 16 cells of the table on p. 52.

(ii) *Scales* : Drawing from Singh's (1967) occupational differential, 16 scales were used. Each factor was represented by four high-loading factor scales. The following were the scales used :

FACTOR I : *Temperament*

1. Strong—Weak
2. Glad—Angry
3. Big—Small
4. Hard—Soft

FACTOR II : *Intelligence—Skill*

5. Efficient—Inefficient
6. Skilled—Unskilled
7. Experienced—Inexperienced
8. Intelligent—Dull

FACTOR III : *Character*

9. Honest—Dishonest
10. Bribe-taker—Bribe-nontaker
11. Patriotic—Traitor
12. True—Untrue

FACTOR IV : *Appearance*

13. Ugly—Beautiful
14. Dirty—Clean
15. Pleasure-seeker—Self-restraint
16. Poor—Rich

(iii) *Sample* : Twenty young men between 25-36 years of age were used as subjects. They were all working in the same organization and had similar educational background.

RESULTS

Table 1 on page 56 gives mean scale score for all the concepts used. It is interesting to note that the teacher is least intelligent, skilled and efficient of all professions and the lawyer most intelligent, and the doctor most skilled. While the engineer is least patriotic, the doctor is most patriotic. This is in spite of the fact that as profession education has a very positive image (Table 2 and the Fig.).

TABLE 1
MEAN SCALE SCORES

SCALE	MEDICINE				JUSTICE			EDUCATION			TECHNOLOGY				N=O	
	Medicine	Sickness	Doctor	Patient	Justice	Offence	Lawyer	Client	Education	Enlightenment	Teacher	Student	Technology	Construction		Engineer
Glad-Angry	0.30	1.40	0.70	-0.75	1.05	1.45	0.45	-0.05	1.50	2.05	0.90	0.35	0.90	0.70	1.25	1.00
Intelligent-Dull	1.40	0.95	2.45	-0.35	2.25	0.60	2.65	-0.70	2.60	1.40	2.10	1.40	2.05	1.70	2.30	1.20
Skilled-Unskilled	1.95	0.15	2.60	0.35	1.80	0.00	2.45	0.45	2.25	1.15	2.05	1.00	2.45	2.15	2.55	1.30
True-Untrue	1.30	0.60	1.20	0.80	2.35	0.10	0.65	1.05	2.15	0.95	1.55	1.30	1.70	1.15	1.36	0.95
Honest-Dishonest	1.00	0.40	1.15	0.15	1.95	-1.40	0.60	0.80	1.90	1.30	2.60	0.75	1.15	1.10	1.40	0.50
Rich-Poor	0.80	0.15	1.40	0.05	0.70	-0.20	0.75	0.30	1.00	0.70	0.15	0.45	1.25	1.50	1.30	2.50
Beautiful-Ugly	0.45	0.60	0.70	-0.60	0.75	-1.15	0.15	-0.05	1.05	0.90	0.55	0.15	1.05	0.85	0.75	1.00
Strong-Weak	0.80	0.90	0.90	-1.50	1.30	0.05	1.10	0.05	0.95	0.95	0.95	0.50	1.50	0.85	1.15	3.00
Efficient-Inefficient	1.80	0.62	2.25	-0.40	2.00	0.15	2.20	0.60	2.00	1.20	1.80	1.25	1.90	1.50	2.25	1.20
Clean-Dirty	0.85	1.05	2.55	0.00	0.70	-0.85	1.05	0.30	1.60	1.00	1.40	1.15	1.20	1.05	1.25	0.80
Pastor-Preacher	0.75	0.00	2.05	-0.10	1.70	-0.55	1.10	0.50	1.75	1.30	1.60	0.90	0.75	3.00	0.90	0.65
Hard-Soft	0.70	0.45	0.60	-0.20	0.65	0.65	0.75	0.50	0.40	0.10	0.10	-0.50	0.80	0.95	0.75	0.25
Self-restraint-Pleasure-seeking	0.20	0.55	0.45	0.45	0.70	-0.15	-0.35	-0.40	0.20	0.25	0.10	0.60	0.45	-1.00	1.50	1.00
Bribe-nontaker-																
Bribe-taker	0.65	0.20	0.45	0.30	0.30	-0.40	0.35	0.50	1.00	1.10	0.85	0.35	0.40	3.00	1.50	-1.00
Big-Small	0.50	0.25	0.35	-0.25	0.40	-0.10	0.15	0.10	0.65	0.55	0.30	0.00	0.65	2.50	3.00	0.35
Experienced-Inexperienced	1.40	0.20	2.40	0.20	1.70	-0.15	1.80	0.50	1.30	1.55	1.80	0.30	1.60	1.20	2.00	1.30

TABLE 2
COMPOSITE FACTOR SCORES
(N=20)

CONCEPT	FACTORS			
	Temperament	Intelligence	Character	Appearance
<i>Discipline</i>				
Medicine	0.57	1.64	0.92	0.57
Education	0.87	1.78	1.70	0.97
Justice	1.01	1.94	1.57	0.71
Technology	0.96	2.00	1.00	0.99
<i>Objective</i>				
Sickness	1.00	0.48	0.30	0.62
Offence	0.60	0.15	0.64	-0.84
Enlightenment	0.91	1.32	1.16	0.71
Construction	1.25	1.64	2.30	0.60
<i>Practitioner</i>				
Doctor	0.64	2.42	1.21	1.27
Lawyer	0.66	2.27	0.67	0.40
Teacher	0.55	1.44	1.53	0.55
Engineer	1.54	2.27	1.29	1.20
<i>Beneficiary</i>				
Patient	-0.67	-0.05	0.34	-0.02
Client	0.15	0.56	0.71	0.24
Student	0.09	0.94	0.83	0.59
Client (org.)	1.15	1.25	0.78	1.29

From composite factor scores it appears that the doctor is little more intelligent than others. As far as character dimension is concerned the teacher has the highest score and the lawyer the lowest. While the patient is rated towards negative pole of intelligence dimension, the client organization has the highest intelligence score. While the patient has negative score on temperament dimension all other concepts have positive scores (Table 2).

On the dimension of appearance, offence and patient have negative scores, doctor, engineer, and client organization have quite positive factor scores.

The highest distance (Mahalanobis, D.) between any two concepts is 3.34 between education and offence (Table 3). The least distance is 0.34 between concepts technology and education, and between student and client. In order to summarize the distance measures, sign test was applied to test whether any pair of concepts differed on overall distance with all other

TABLE 3
D MEASURES BETWEEN CONCEPTS

Concepts	Medicine	Sickness	Doctor	Patient	Justice	Offence	Lawyer	Client	Educa- tion	Enlighten- ment	Teacher	Student	Technology	Construction	Engineering
Medicine	—														
Sickness	1.37	—													
Doctor	1.29	2.26	—												
Patient	2.25	1.92	3.19	—											
Justice	0.85	1.05	0.90	2.97	—										
Offence	2.09	1.58	3.18	1.55	0.58	—									
Lawyer	1.14	1.87	1.03	1.11	1.76	2.88	—								
Client	1.22	1.29	1.23	1.11	2.98	1.55	1.61	—							
Education	0.91	2.63	0.89	3.12	0.43	3.34	0.36	2.49	—						
Enlightenment	0.58	1.75	1.27	2.16	0.85	2.51	0.57	1.73	0.95	—					
Teacher	0.64	1.76	1.27	2.86	1.22	2.64	0.97	1.83	1.29	1.67	—				
Student	1.24	1.18	1.94	1.44	1.47	1.79	1.28	0.34	0.79	0.83	1.51	—			
Technology	1.04	1.69	0.63	2.12	0.45	2.98	0.66	1.84	0.34	0.79	0.83	1.51	—		
Construction	1.56	2.36	1.61	2.52	1.55	2.41	0.81	1.33	1.70	0.57	0.70	1.30	0.61	—	
Engineer	1.15	2.19	0.92	3.17	0.76	2.99	0.74	1.97	0.78	0.98	0.57	1.64	0.34	0.74	—
Client															
Organization	1.01	1.14	1.34	1.48	1.44	1.81	1.18	0.75	1.61	0.79	1.14	0.54	1.35	0.79	1.32

concepts. It was found that none of the disciplines differed significantly. When objectives were compared only enlightenment and construction did not differ significantly. Among practitioners distances were not significant. The patient differed significantly with the client, student organization (Table 4).

TABLE 4
PROBABILITIES FOR SIGN TEST

		<i>Pairs</i>	<i>p</i>
<i>Discipline</i>	Medicine	v. Justice	.500
	Medicine	v. Education	.304
	Medicine	v. Technology	.500
	Justice	v. Education	.059
	Justice	v. Technology	.395
	Technology	v. Education	.059
	Sickness	v. Offence	.004
	Sickness	v. Enlightenment	.029
	Sickness	v. Construction	.151
<i>Objective</i>	Offence	v. Enlightenment	.018
	Offence	v. Construction	.018
	Enlightenment	v. Construction	.304
<i>Practitioner</i>	Doctor	v. Lawyer	.059
	Doctor	v. Teacher	.304
	Doctor	v. Engineer	.059
	Lawyer	v. Teacher	.500
	Lawyer	v. Engineer	.605
	Engineer	v. Teacher	.304
	Patient	v. Client	.018
	Patient	v. Student	.004
	Patient	v. Client Organization	.004
<i>Beneficiary</i>	Student	v. Client	.052
	Client	v. Client Organization	.151
	Student	v. Client Organization	.151

DISCUSSION

It is really interesting that the student and the client or litigant should have very little distance; similarly, the teacher and the lawyer do not have very large distance. The lawyer did not recently have high image but teachers also seem to have lost much of the traditional high image if not of reverence but at least of being respected. High distance between offence and education indicates the belief that education can take care of

offences. When distance between any two concepts is significant it is clear that these two have no association. This is also contrary to the belief in certain quarters that education and offence have some association. Education does not lead to crime although it sometimes leads to unemployment in India. Therefore, it is likely that more of education would mean less of offence.

Considerably high score for all professions on intelligence factor shows that the traditional professions have good intellectual tradition. Similarly, high scores on this factor for practitioners of these professions shows high intellectual tradition of these professions. Appearance seems to go with modernity and that may be the reason why doctor, engineer and client organization have higher factor score on appearance.

The doctor has only some distance with other professions (Table 3) and overall distances are not significant (Table 4) which shows that although traditional professions differ on certain factors yet hold similar image in the public.

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Concepts	Medicine	Sickness	Doctor	Patient	Justice	Offence	Lawyer	Client	Education
	1.37	1.29	2.25	0.85	2.00	2.00	2.00	2.00	2.00

Realities of Global Interdependence

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THE SIXTIES witnessed an enormous surge of optimism that education was the key to development, particularly in the less developed countries. Education, simply viewed as a social service, became recognized and became, respectable component of development plans and aid strategies. Lack of trained manpower, it was said, constituted the critical bottleneck on the road to industrialization and modernization, and aid agencies responded with buildings, scholarships, loans, grants, technical assistance, and numerous efforts to introduce new technology and innovative practices into the outdated school systems.

Reflecting the multinational character the International Division, e.g. Unesco and other international agencies included participants from all over the world. The major areas of concern for the Division were sharing information on the United States activities with colleagues around the world, learning more about effective uses of educational technology in non-U.S. setting and establishing professional linkages worldwide.

Unesco is a major international body coordinating and initiating projects bilaterally among 122 members of the United Nation states.

In 1960, several academic programmes have been initiated by the USAM in India to improve the standards of teaching, examination and research at the secondary, college and university levels.

*Summary of a paper presented at Texas Southern University (27 February 1976)

4. How do we design systems that do not conflict with national interests and regional concerns ?

- (i) Widening the range of media.
- (ii) Systematic grouping.
- (iii) Increased accessibility of media.

In 1970, we are facing the problem of world policy issues concerning satellite system utilization. The role of the educator is expanding into global proportions. The current U.S. policy is to concentrate on the affirmative principle of expanding free and open exchange of information and ideas while respecting cultural differences and maximizing the beneficial uses of space communications. The role of the educator begins now with involvement in using the existing satellite systems for international exchange among the professions, cultural interest groups, and educational institutions.

Professional people should carry on dialogues and discussions, reporting on scientific papers, and the results of studies through video and audio exchange.

Such procedures would go far to reassure other nations that this country does not intend to employ satellite technology as a monstrous propaganda machine or as an aerial advertising gusher with which to pollute the skies of the world. (83 countries are cooperating in this programme.)

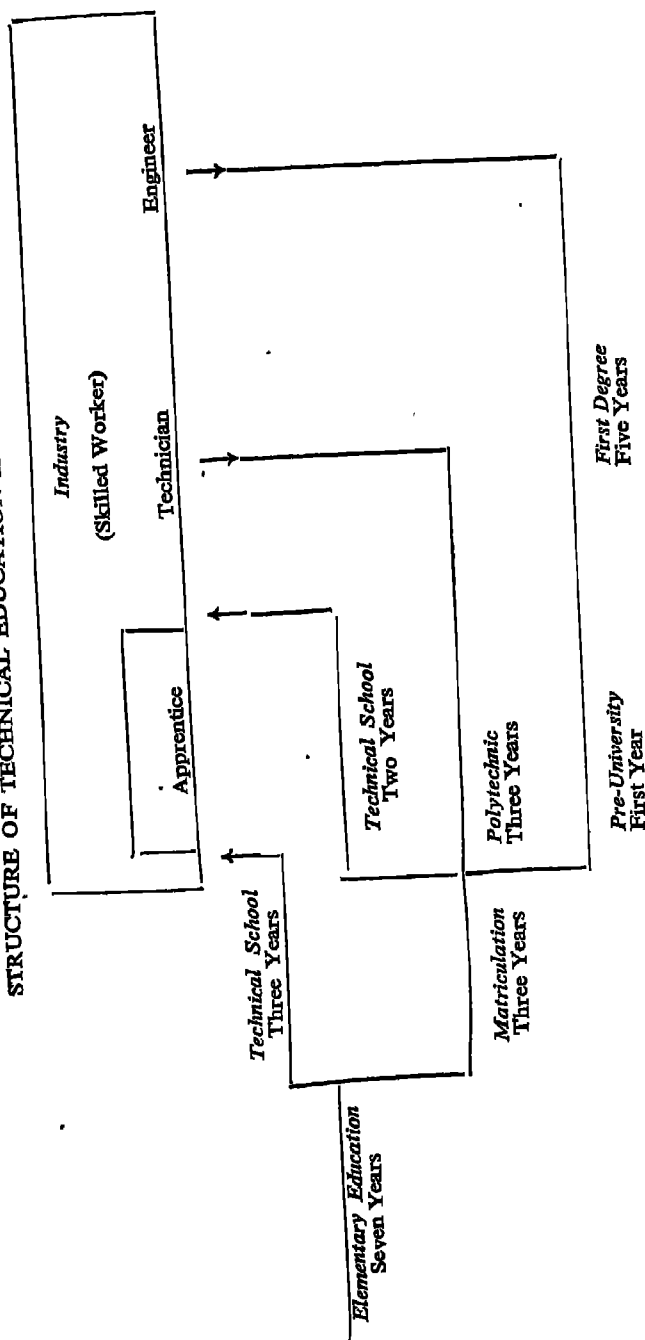
VISITING STUDENTS' VIEWS

Students' choice of the United States was generally on the reputation of the United States for excellence in technology. However, it was suggested that faculty in media might make greater use of media in their presentations. Students suggested that projects done in their American training be useful and readily applicable to their educational setting on their return home. Concern was also voiced for the problems involved in cultural transaction, where media is used at a very high level in the United States and at a lower level in the developing nations.

Attention was focused on the problem of foreign students needing apprenticeships to practise their skill as they go through their training. The problem of providing them with work-experience is considered very important.

There were good marks for the breadth and diversity of programmes, but the need for better advising and counselling was cited. English was considered somewhat a barrier to learning in that it imposes additional burdens of time on the student who is involved with course content.

STRUCTURE OF TECHNICAL EDUCATION IN INDIA*



*Source : L. S. Chandrakant, Joint Educational Adviser, Ministry of Education, *Fourth Five-Year Plan of Technical Education : A Draft Report*, November 1965, p. 111

Primary School Teachers' Understanding of the Science Curriculum of the Unesco- Unicef Assisted Scheme in Delhi

An Investigation

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The study was undertaken with a view to finding out the reactions and suggestions of the science teachers regarding science curriculum, content, teaching processes, instructional materials, equipment, evaluation scheme, suitable material for teachers and for Classes I and II. The study deals extensively with the history of Unesco-Unicef projects' phasing, approach, curriculum, new trends in teaching of science and research work done so far in this field. New areas for research work also have been suggested for improving the quality of teaching science at the primary level.

Need for the Study

UNDER the Unesco-Unicef science and mathematics teaching project, instructional materials have been prepared by the NCERT and these have been adopted/adapted by almost all the states. Eighteen states and four union territories have completed the pilot stage by now.

Under this scheme the laboratory equipment, workshop tools and library books have been supplied to 15 State Institutes of Science Education, 17 State Institutes of Education, 121 teachers' colleges and 426 teachers' training schools. Unicef is sharing 50% costs of the inservice training programmes and some other expenses also.

The implementation of this scheme in Delhi schools has been in vogue for quite some time. Hence the need for this study to know about the impact of this programme on teaching of science.

Objectives of the Study

The following major objectives were kept before the study :

1. To investigate the extent of teachers' understanding of :
 - (a) the content proposed under the Unesco-Unicef project,
 - (b) the processes of science emphasized under the Unesco-Unicef scheme.
2. To study the effectiveness of the programme of inservice training—its duration and time.
3. To investigate into the type of the material needed for :
 - (a) teaching in Classes I and II,
 - (b) teachers' professional growth.
4. To find out if the instructional materials envisaged in the scheme were made available on time.
5. To study the views of the teachers regarding the use of technical words in the books.

Delimitations of the Study

The Study was delimited to only those primary school teachers of Municipal Corporation of Delhi who were attending the inservice training programmes at the Science Centres located at Rajouri Garden, Karol Bagh, More Sarai and Lajpat Nagar. It was also delimited to the physical

July 1977

PRIMARY SCHOOL TEACHERS' UNDERSTANDING OF SCIENCE CURRICULUM

science portion of the Unesco-Unicef Science Teaching Scheme for the primary level.

Data Collection

The data were collected through a schedule and authenticated personal interview with 25 teachers teaching in Class V, 75 teachers teaching in Class IV, and 575 teachers teaching in Class III, from 6 to 24 December 1974.

FINDINGS

In the light of the objectives of the investigation, the following findings and observations can be drawn as a result of this study.

1. Teachers' Understanding

(a) Content prepared under Unesco-Unicef project

In spite of the fact that the Unesco-Unicef syllabus training programme has been in operation in the primary schools of Delhi since 1972, the study reveals that the knowledge of teachers, both factual and conceptual, including the practical application has been poor, e.g.

- Many teachers mentioned the Sun, Rahu and Ketu as planets.
- Some of them mentioned the Venus as star.
- Some of them who mentioned the nine planets, recorded that they had not seen any planet.
- Majority of the teachers were not acquainted with any constellations, even Saptarishi.
- Not a single teacher was acquainted with tides, and the law of gravitation meant for them falling of bodies.
- Some of the topics in physical sciences such as the law of gravitation, tides, golden rule of mechanics were reported to be difficult for the primary school teachers. This was revealed in the content test.
- Performance of the primary school teachers who studied science in their school period does not seem to be significantly different from those who had no schooling in science except what they studied in their pre-service training course.
- Higher qualifications in subjects other than science do not in any way result in better content knowledge in science.

(b) Teachers' understanding of the processes of science

- On an average, the primary school teachers were unaware of the various processes of science.
- Some of them, however, knew the process of experimentation, though not in a scientific way.
- The urgent need of the primary school teachers is the acquaintance with the way of experimentation rather than knowing various terms involved in processes.

2. Effectiveness of Inservice Programmes

- The present system of organizing inservice courses of ten days' duration at any time of the year is not reported to be fruitful in any way.
- The best period as preferred by female teachers regarding the organization of inservice courses is the beginning of the session but male teachers preferred these courses during summer vacations. Teachers do not like these courses to be organized in the middle or towards the end of the session.
- Most of the teachers preferred that inservice courses of this type should be of two weeks' duration.
- The Science Centres at which these courses are being organized are not adequately equipped for the proper inservice training of teachers.
- Some of the resource expertise was reported not to be conversant with the approach and philosophy of science teaching under the scheme.
- There is need to provide regular inservice course for supervisory staff involved in the execution of inservice courses.
- Generally, teachers are invited to these courses at a short notice. They are not given proper information about the scheme of work to be followed.
- The objectives of inservice programmes seem to be ambitious in present circumstances (time, duration, material, etc.)
- Most of the impact of these courses has been noticed in content and methodology.
- There is a lack of democratic teaching in inservice training programmes.
- Most of the resource persons did not confine to teachers' comprehension level.

3. To Investigate into the Type of Material Needed

(a) For teaching in classes I and II

- Teachers expressed the need of a teachers' guide and in their view it is the most important tool which must be available to every teacher.
- There is a need of curriculum charts covering the whole syllabus prescribed for Classes I and II.
- Teachers expressed the view that the content be mentioned in the prescribed books for Classes I and II and also in the Class III textbooks to enable them to teach effectively.
- Textbooks and workbooks do not find an important place in the teaching of science in Classes I and II.

(b) For teachers' professional growth

- There is a need of one fully illustrated book having all the content to be taught including the preferred method.
- Need to have more enrichment programmes for their professional growth.

4. Availability of Instructional Material

- Instructional material such as handbooks of activities, teachers' guides, science magazines are not available to teachers either in schools or at their Science Centres.
- Even the kit material is not well known to some of the teachers.

5. Views Regarding the Use of Technical Terms to be Used in the Books

- Most of the teachers do not favour the use of difficult technical words in the books.
- Some teachers like the use of common technical words but with a suitable explanation in easy equivalents.

6. General

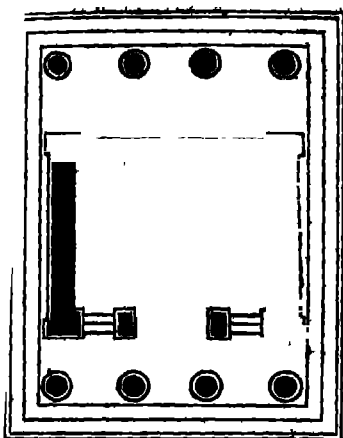
- Majority of teachers teaching science in primary classes had not studied science in their schools.
- It seems from this small sample that male teachers having science background are nearly $1\frac{1}{2}$ times in comparison to female teachers.

- Poor content knowledge and application of knowledge is perhaps because of three important considerations :
 - (a) poor academic background in science,
 - (b) time lapse between pre-service and inservice courses,
 - (c) too ambitious inservice courses resulting in poor impact.
- Teachers expressed that there is a need of separate science teacher, who should not be loaded with the responsibility of being a class-teacher as well. This would enable him to prepare and teach science effectively.

SUGGESTIONS FOR FURTHER WORK

During the course and as a result of the investigation a number of related studies which came to the mind of the investigator and on which further research work is possible are listed below :

- A state-wide survey of the difficulties of the teachers teaching science at the primary level.
- Exploration of various types of activities and their instructional value.
- Position of science teaching in teacher-training schools.
- Ways and means of enriching the pre-service training curriculum.
- Effective use of the duration of inservice training.
- Effective instructional material for the primary school teachers. □



Ph.D. THESIS ABSTRACT

A Study of Reaction to Frustration

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Introduction

THE STUDY of frustration is important because of its close relation with the understanding of normal and abnormal behaviour, its inevitability in human life, its role in human adjustment and its growing importance in modern era. The importance of the study of frustration has come to the forefront with the emergence of clinical psychology. One of the complex, real-life problems to which our attention was turned was that of frustration. The special impetus for the interest in this particular topic was undoubtedly the work of Freud (1933). It was Freud who first of all established causal relationship between frustration and behaviour disorders. Independently of Freud's studies, Pavlov (1927) conducted his experiments in Russia on the physiology of dogs. During his experiment he found that animals lost their learnt behaviour (conditioned reflexes) and lapsed into a confused state. This was the phenomenon of frustration. Since then, the study of frustration is gaining importance, both for its value in contributing to the understanding of some theoretical problems, and for its practical usefulness in understanding the dynamics of behaviour.

It is universally accepted that frustrations have always been inevitable in human life and are more so in the present age. In the twentieth century one has to face business competition, marital problems, social laws and taboos, international tensions, value-conflict, economic problems, and many others. Its inevitability also consists in the fact that frustration is closely related

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with the problem of "adjustment, change, personality development on growth". In all social strata and in all phases of personality development each one of us is bound to face frustration repeatedly. The conditions, which the organism learnt to master in the past, change there is frustration, and it lasts until the organism learns to master the new conditions.

Frustration studies have been particularly useful in connection with personality studies and behaviour disorders. Murphy (1947) has pointed out the effects of frustration in moulding personality. According to him, "profound frustration is characteristic of modern man, woman and child so characteristic that the sociologist and the psychiatrist take it for granted and attribute to it much of the neuroses and psychoses that characterize society today. Individual variations in both general and specific frustration-tolerance are influential in determining one's susceptibility to the behaviour disorders. It is, however, not only the kind and degree of stress a person can endure that determines one's individual susceptibility to behaviour disorders. Equally important is the influence of the kind of adjustive techniques one 'favours' as his reaction to frustration, their adequacy, and the ways in which he utilizes them. The 'choice of neuroses' or proneness for a particular behaviour disorder, depends to a large extent upon the relationship which different behaviour disorders bear to the 'unskilled' use of each special adjustive techniques as a consequence of reaction to frustration.

Whether frustration plays a 'constructive' or 'destructive' role in life depends upon the way an individual reacts to frustrating situation. The type of reaction to frustration has an "important bearing on the general comfort and affectiveness with which one lives". 'Constructive' and 'destructive' refer to adaptive and maladaptive (neurotic or psychotic) reaction to frustration. By analyzing the factors causing particular reaction to frustration, the investigator may assist the individual in making successful or effective adjustments to frustrating situations and to leave those which disrupt the process of adjustment. If frustration has both 'constructive' and 'destructive' value in life, the aim of the investigation into the determinants and reaction-patterns should be to encourage 'healthy' reactions in resolving frustration, rather than dealing with them inadequately. One of the healthy reactions is, when individual intensifies his effort to reach the goal and faces the situation as it is rather than taking help of the defence-mechanisms or resorting to abnormal behaviour.

Purpose of the Study ✓

It is against this background that the present investigator prepared a plan for studying the reactions to frustrations in the adolescents and adults

(both male and female) ranging from 14 years to 35 years of age. This study intends to give clues to the understanding of the patterns or modes of responses to frustrating situations in the above-mentioned age-groups.

The second aspect of the problem was to ascertain the effects of certain factors in determining the modes of responses to frustration. The study aims to find out whether there is any difference in the pattern of reactions associated with the variables like age, sex, religion, residence, economic status, education and personality. The problem for the investigator is to determine, as to what change these independent variables produce in the reaction patterns of the subject.

Before proceeding further it is necessary to define the term 'frustration'. It has been defined in many ways by different psychologists, but all of them agree on its general nature. One of the principal characteristics of the human behaviour is, that it is motivated or goal-directed. When motivated behaviour is blocked by an obstacle tension is produced and it lasts as long as the barrier is present, but frustration occurs only when the organism meets hindrances which are difficult or impossible to overcome.

In the present investigation, an effort has been made to throw light on certain personality factors influencing reactions to frustration as well as the pattern of reaction has been analyzed on a sample of Indian college-going population. The variables that have been taken into account are (a) age; (b) sex; (c) education; (d) religion; (e) residence; (f) economic status, and (g) personality. These are independent variables and differentials in reaction as dependent. In short, the main objectives of the study are :

- (a) to investigate the pattern of reactions to frustration;
- (b) to detect the most characteristic reaction in terms of the frequency in the pattern of reaction;
- (c) to find out the influence of certain independent variables (age, sex, education, religion, residence, economic status and personality) in shaping reaction patterns of the subjects;
- (d) an effort has also been made to find out the relation between what the subject says he actually does in a frustrating situation (Actual-response) and what he thinks he should or ought to have done in a frustrating situation (Ideal-response);
- (e) the study traces the trends for each response-category by distribution of responses.

Method and Procedure

On the basis of the studies conducted earlier, the following hypotheses are

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made about the role of certain variables, which may cause a difference in the reaction patterns of the subjects.

That the frustration reaction patterns of male and female would be different.

That the reactions to frustration of adolescents and adults would be different.

The reaction patterns of rural and urban subjects will differ.

The reaction to frustration will be influenced by religion.

That the subject's reactions will be influenced by status.

That the reaction to frustration will be affected by the high scores on 'neuroticism' and 'extroversion'.

There is a subsidiary hypothesis that the 'ideal' and 'actual' reactions of the subjects will differ.

Sample

Sample was selected to suit the purpose of the study. Strict procedure for random sampling was not followed. Total number of subjects, selected for studying reaction patterns under frustration and the influence of certain variables governing the reactions, were 203 college students. Sub-groups are mentioned as follows :

<i>Variables</i>	<i>Sub-groups</i>
AGE	(a) Adolescents (13 to 20 years of age) (b) Adults (21 to 35 years of age)
SEX	(a) Males (b) Females
EDUCATION	(a) Tenth and Intermediate students or any equivalent standard (b) B.A. and M.A. students or any equivalent standard
RESIDENCE	(a) Rural (b) Urban
RELIGION	(a) Hindu (b) Non-Hindu
ECONOMIC STATUS	(a) Higher (Rs.800 and above) (b) Middle (Rs.300 to 750) (c) Lower (Rs.250 and below)
PERSONALITY	(a) Neuroticism (b) Extroversion
CULTURAL NORMS	(a) 'Actual' condition (b) 'Ideal' condition

So far as religion is concerned, there were very few subjects from other

religious groups. All of them were, therefore, included under 'non-Hindu' category. Personality variables included high scores on 'neuroticism' and 'extroversion' upon Maudsley Personality Inventory Test (MPI).

The subjects selected for the study were both male and female, half of them belonging to rural and half to urban areas. Urban area represented Delhi population. Fifty of them (both male and female) were chosen from Delhi University and degree college studying in B.A. and M.A., and 50 (both male and female) from schools and colleges studying in 10th and intermediate classes. Rural subjects were selected from the degree college and schools and colleges. Students belonged to a nearby village of Delhi. Fifty others (both male and female) were selected from degree college and 50 (both male and female) from schools and colleges. In rural areas girls were not easily available, therefore, there were only three girls from degree college (rural) and none could be found from 10th and intermediate classes.

Thus, there were 24 rural males from 10th and Inter classes and 26 ($24 + 26 = 50$) urban males of the same educational qualification. Three girls could be found from B.A. and M.A. classes of rural group and 47 were selected from Delhi ($47 + 3 = 50$). Twelve boys could be found from B.A. and M.A. classes (of rural group) and 40 from Delhi ($12 + 40 = 52$).

Adaptation of the Technique and its Administration

Psychologists have been using various techniques for studying reactions to frustration. The present study used questionnaire device to investigate this problem. Looking at the limited span of time and other facilities it was not possible for the experimenter to adopt other methods for the study of reactions to frustration. Two forms of questionnaires were used, one is 'multiple-choice' questions where the responses of the subjects were limited to stated alternatives and they were required to check one of them, which appeared to be more appropriate and nearer to their own reactions. The responses in this case are pre-coded. While in open-end the subjects had complete freedom to write responses freely for themselves in their own characteristic way. Here, the coding was done after the data collection. These two types of questionnaires were made to make the study more comprehensive and complete, and to get a chance to compare the relative reliabilities of both the forms separately.

In developing open-end questionnaire for the present study the same model was followed as by Dollard, *et al.* (1939) and later used by Pastore, Rothans, Worchel, Kregarman and Cohen. The 'multiple-choice' questionnaire of this study follows the same pattern as used by Christiansen, in his study about the "Attitude toward Foreign Affairs as a Function of

Personality". Both the questionnaires present some frustrating situations on the one side of the form, but the difference is that in the former case the subjects are free to write their reactions, while in the latter, they are provided with six alternative reactions for checking one of them as their own reaction.

Next step which follows is to prepare the first draft of the questionnaire by collecting 40 frustrating situations. Efforts had been made to include in both forms of the questionnaire, samples from everyday situations of life. Situations were collected on the basis of the investigators' own frustrating experiences and by asking people about their frustrations. Situations covered both minor and major frustrations. The minor frustrations included those which did not last long and were temporary in their duration and affect. In the present case the following situations included minor frustrations:

<i>Situation Numbers</i>	<i>Frustrations</i>
2.	Criticism of one's college
3, 14.	Disturbing noises
4.	Clothes being spoiled
5.	Bad temper of some third person
6.	Microphone-disorder
7.	Loss of one's clear object
9, 22.	Delay
20.	Splitting of milk
25.	Being ridiculed

Major frustrations exert more durable affect upon the individual. These are more disturbing, followed by more serious consequences. In the present questionnaire, the following situations are concerned with major frustrations.

<i>Situation numbers</i>	<i>Frustrations</i>
1.	Insecurity
8, 16, 21.	Conflict of decision
10, 11, 17, 18, 24, 26.	Attack on prestige
12, 13.	Unexpected behaviour from others
15.	Disturbance in career
19.	Threat in love
23.	Attack on sentiments

The situations were formulated in simple and clean Hindi language so as to make the subjects easy to comprehend. The original draft of the subjects situations (total 40) was prepared in English language, which was later translated into Hindi because the subjects comprising the sample had a fair knowledge of Hindi.

PRE-TESTING : All the 40 situations were arranged in random order. Then these were administered individually on 18 adult subjects, nine male and nine females. Subjects were required to write down their own reaction corresponding to each frustrating situation. The try-out of the questionnaire was to see how it worked and whether changes were necessary for the 'population' on which it was to be administered finally. Pre-testing upon the sample, extracted from the same 'population' provided a means of catching and solving unforeseen problems in the final administration of the questionnaire, such as phrasing and the sequence of the questions or its length, need for additional questions or the elimination of others.

When the pre-testing was over, situations were eliminated on the basis of the following criteria :

- (a) Vagueness and ambiguity of the situation.
- (b) Whether it has been understood as a frustrating situation.
- (c) No response variety, i.e. which elicited stereotyped responses.
- (d) Frustration not intense enough.
- (e) When two or more situations appeared alike.

Twenty-six situations out of 40 were eventually selected for both forms of questionnaires. Both 'open-end' and 'multiple-choice' questionnaires consisted of same frustrating situations.

For the purpose of formulating the 'multiple-choice-question' for the subjects, pre-coding of the responses was done. This step follows the selection of responses for providing response-alternatives to the subjects. As decided earlier, the responses were to be analysed into six categories : Outward threat (E), Inward threat (I), Passive threat (M), Outward problem (e), Inward problem (i), and Passive problem (m). This is why, six possible response-alternatives, belonging to each category, were selected for all 26 frustrating situations.

Coding was done after the full agreement of all the 'four' judges or 'experts' (including the investigator herself), selected for this purpose. All of them assigned response for each of the six categories and for all 26 situations, independent of each other. Later, their responses were compared with each other. After discussion all of them agreed unanimously for the responses fit for the categories. This process, called as 'coding', was done for

validating the response alternatives for each situation. Finally, six response alternatives for each of the 26 situations were arranged in random order. The following procedure was adopted for the final administration of the test.

Main Investigation

First of all, the subjects were given for filling the open-end questionnaire. There they were required to fulfil two types of responses: (i) Actual, (ii) Ideal. In 'Actual' they were supposed to write the way they would actually behave in that situation. In 'Ideal' they would mention the way they 'ought' to have behaved. Next day the same subjects were required to fill it again for the purpose of checking the 'reliability' or the consistency of the responses. Thereafter they were provided with multiple choice to select one of the six alternative reactions for each situation. The next day this form was also administered again to check its reliability. Multiple-choice questionnaire was administered after open-end, so that the subject's free reactions had no chance of being affected by the responses prepared by the investigator herself. A third test came, when the two forms of questionnaires were completed by the subjects, i. e. Eysenck's 'Maudsley Personality Inventory' (MPI Hindi version). It measured the degree of 'neuroticism' and 'extroversion' for each individual. Subjects were allowed to ask any question regarding the phrasing, comprehending any situation or instructions for filling the questionnaire.

Immediately after the administration of the three questionnaires the 'inquiry' was conducted on the subjects. The investigator went through the responses and saw if there were any doubtful ones. Sometimes the subjects were asked to read aloud the responses they had written, so that the investigator may note any significant voice inflections and can ask non-leading questions, in order to obtain more adequate information for scoring purposes. In cases where the answers were too brief or ambiguous, 'inquiry' was made to amplify them for the scoring.

Scoring

The method for scoring the responses is the same as used by Christensen. Scoring categories as adopted for the present purpose can be represented by the Table on next page.

A STUDY OF REACTION TO FRUSTRATION

SCORING CATEGORIES

<i>Direction of Reaction</i>	<i>Forms of Responses</i>	
	<i>Threat-oriented</i>	<i>Problem-oriented</i>
Outwardly directed	Blame ascribed to others (E)	Problem-solving demanded of others (e)
Inwardly directed	Blame ascribed to oneself (I)	Problem-solving activity imposed upon oneself (i)
Passively directed	Blame implied in emphasizing forgiveness or absolution (M)	Problem-solving expected or trusted to take place by itself with time (m)

The above Table indicated that scores are assigned to each responses in terms of 'direction' and 'form' of a reaction. Directional dimensions included, outwardly directed, inwardly directed, and passively directed. Under form dimensions fall threat-oriented and problem-oriented. From combination of these three categories results six possible scoring variants for each situation. These are as follows :

<i>No.</i>	<i>Types of Reaction</i>	<i>Scoring Symbols</i>
(i)	Outward threat	E
(ii)	Outward problem	e
(iii)	Inward threat	I
(iv)	Inward problem	i
(v)	Passive threat	M
(vi)	Passive problem	m

Coding of open-end questions was performed after the administration of the test was over. Each response was coded into one of the categories mentioned above (E,I,M,e,i,m).

The experimenter's coding was compared by the independent coding of an 'expert', to ascertain the reliability of the assigned categories to the responses. Only 8 responses out of 1040 ($40 \times 26 = 1040$) were scored differently (i. e. 76% agreement). Later on, after some discussion about the definition of the categories, both the investigator and the 'expert' came to an agreement for 8 responses also. This shows that the scoring is very reliable or dependable.

The consistency of the subject's responses or the reliability was computed by the test-retest method. It was not administered immediately, so as to avoid the memory or practice effect of the subjects. The gap for a day was

also not so long, which may affect the results by constantly changing external and internal variables. Therefore, a day's gap was considered as a sufficient time interval elapsed between first and second administration of the questionnaire, for getting closer estimate of the actual consistency on dependability of test scores.

Correlation was computed between the first and second sets of scores by applying the χ^2 test of independence in contingency tables. So far as the reliability of the free-response questionnaire was concerned, χ^2 1.3, df 5 and p 0.9 (90%). Thus, there exists no true difference between the first and second administration of the same questionnaire. Subject's response can therefore be said to be very reliable.

In the same way the reliability for the multiple-choice test was also computed, χ^2 11.1, df 5 and p .05 (5%). It indicates that there is significant difference between the first and second administration of the test. Therefore, this test is unreliable and should not be considered.

Besides this, product-moment correlation (r) was also calculated between first and second form of questionnaires for each category separately. No correlation gives the significant result.

Low retest reliability of the multiple-choice indicated that it was not a tool which could give consistent results. The intercoding reliability of the 'open-end questions', on the other hand, was high. Hence, the latter technique was found to yield more consistent result and was retained for the final analysis, while former was discarded. The analysis of the results is based on the data obtained by the open-end questions.

Results

Now the main findings will be discussed. Data were scored according to the categories mentioned earlier. Subjects were categorized according to the variables under investigation. First of all, frequency distribution was made for all variables upon all categories of responses. Graph was made for all response categories. Means, medians, modes, standard deviations, t and p values for the significance of the skewness of the curves were computed for each variable. The effect of personality variable upon reactions was studied by correlation. 'Ideal-Actual' responses were also correlated. Percentage-difference, significance of the mean difference of the skewness (SK) of each distribution was calculated.

The following tables represent the significance of skewness of all the distributions made for each response pattern (Actual and Ideal). Computation of t and p values were made to ascertain the extent of skewness for all the 12-curves.

A STUDY OF REACTION TO FRUSTRATION

SIGNIFICANCE OF THE DISTRIBUTION OF REACTION PATTERNS (ACTUAL)

<i>Reaction Patterns</i>	<i>Mean</i>	<i>Mdn</i>	<i>SD</i>	<i>t</i>	<i>p</i>
E	10.94	11.3	5.14	-2.66	.05
I	1.9	1.5	1.6	80.33	.01
M	5.1	4.11	3.6	2.75	.02
e	2.18	1.25	1.71	1.44	.12
i	6.65	5.73	3.86	21.8	.01
m	0.44	5.23	.91	254.33	.01

SIGNIFICANCE OF THE DISTRIBUTION OF REACTION PATTERNS (IDEAL)

<i>Reaction Patterns</i>	<i>Mean</i>	<i>Mdn</i>	<i>SD</i>		<i>p</i>
E	4.5	4.00	3.22	2.3	.02
I	1.52	1.0	1.33	16.74	.01
M	6.86	4.61	3.0	37.5	.01
e	2.28	0.16	2.38	17.4	.01
i	10.73	11.72	3.8	-15.50	.50
m	0.68	-45.75	1.22	22.0	.01

Correlation (*r*) was computed to know the ratio, which expresses the extent to which changes in one variable are accompanied by or are dependent upon changes in the second variable. Correlation was calculated to examine the relationship of one variable (reaction to frustration) to another (neuroticism and extroversion, successively).

CORRELATION (R) BETWEEN REACTION-VARIANTS AND PERSONALITY VARIANTS

<i>Reaction Variants</i>	<i>Personality Neuroticism (N)</i>	<i>Variants Extroversion (E)</i>
E	0.52	0.10
I	0.33	-0.14
M	0.02	0.30
e	0.01	0.13
i	-0.37	0.20
m	0.09	0.13

The analysis of the responses was done in four ways:

- (a) by making frequency-distribution and graphs, to know the dominant patterns of reactions to frustration,
- (b) by computing mean, standard deviations and critical-ratios, to study the reactions to frustration as associated with certain variables,
- (c) personality variables (neuroticism and extroversion) were studied by computing correlations (product-moment), and
- (d) the analysis of the subdivided groups was done by calculating percentage and significance of the percentage differences. Dominant reaction was studied according to problem-threat dichotomy, decided on the basis of the probability of the responses, and the effect of variables was studied by computation of the significance of the percentage differences among the variables compared.

The results show that though majority has not reached in aggressive manner (E), as normal curve was obtained, but so far as the frequency of the responses goes it is the most frequent response of the group, then comes inward problem (i), passive threat (M), outward problem (e), inward threat (I) and passive problem (m), successively.

In case of 'ideal' responses (the way an individual ought to have reacted) inward problem (i) reaction is more frequent than any other reaction, i.e. subjects have behaved mostly in problem-solving manner. Then comes passive threat (M), outward threat (E), inward threat (I) and passive problem (m), successively.

The category 'E' shows the highest and 'm' as the lowest percentage of scores in all the tables of percentage differences. Besides this, 'm' response shows the lowest percentage of scores in all the tables of percentage difference.

In short, the analysis of the subdivided groups shows the following significant results.

Age-variable

Adult males are considerably more inclined to evade aggression than adolescent males. Adolescent males are more problem-solving than adult males.

Adult females are significantly more inward-threat and passive threat-oriented rather than adolescent females. Adolescent females are considerably more problem-solving than adult females.

Sex-variable

Adolescent males are significantly more aggressive as compared to adolescent females. Adolescent females are considerably more passive-threat, outward-problem, inward-problem and passive problem-oriented rather than adult males.

Residence-variable

Rural-adolescent males are significantly more passive threat-oriented rather than urban-adolescent males. Urban adolescent males are more problem-solving than rural adolescent males.

Residence-variable has not affected the responses at all so far the comparison between rural-urban adult males is concerned.

Religion-variable

None of the response-patterns are significant among Hindu-non-Hindu adolescent females.

Hindu adolescent males are considerably more problem-solving than non-Hindu adolescent males.

Religion has not affected the response of 'Hindu-non-Hindu adult females.

Non-Hindu adult males are considerably more outward threat-oriented (aggressive) as compared to Hindu.

Economic Status-variable

(a) Adolescent females

Lower status adolescent females are significantly more passive threat-oriented rather than higher status adolescent females.

Average-status adolescent females are considerably more inward threat-oriented rather than higher status adolescent females. Higher status adolescent females are more problem-solving than average-status adolescent females.

Lower status adolescent females are significantly more passive threat-oriented rather than average-status adolescent females. Average status

adolescent females are considerably more passive problem-oriented rather than lower-status adolescent females.

(b) Adolescent males

Higher status adolescent males are significantly more outward threat-oriented (aggressive), inward threat-oriented and outward problem-oriented rather than lower status adolescent males. Lower status adolescent males are considerably more inward problem-oriented as compared to higher status adolescent males.

Higher status adolescent males are considerably more inward threat and outward problem-oriented as compared to average-status adolescent males.

Average-status adolescent males are significantly more aggressive as compared to lower-status adolescent males. Lower-status adolescent males are considerably more passive threat-oriented rather than average-status adolescent males.

(c) Adult females

Higher status adult females are significantly more problem-solving as compared to lower status adult females.

Higher status adult females are significantly more aggressive rather than average status adult females. Average status adult females are considerably more inward-threat, passive-threat and passive problem-oriented than higher-status adult females.

Lower-status adult females are considerably more aggressive rather than average-status adult females. Average-status adult females are significantly more inward-threat and inward problem-oriented in their responses, as compared to lower status adult females.

(d) Adult males

Lower-status adult males are significantly more aggressive as compared to higher-status adult males. Higher-status adult males are significantly more problem-solving in their response rather than lower-status adult males.

Average-status adult males are considerably more aggressive rather than higher-status adult males. Higher-status adult males are significantly more problem-solving rather than average-status adult males.

Lower-status adult males are significantly more aggressive as compared to average-status adult males. Average status adult males are considerably more passive-threat and outward problem-oriented rather than lower-status adult males.

Discussion

The question now arises that how far the present findings conform with the findings already done in the field of frustration and its reaction. In the first point, which is significant in this study, is that it does not agree with the theory presented by Dollard and others (1939) that the existence of frustration always leads to some form of aggression. Varieties of reactions are favoured by this study, as favoured by Rosenzweig (1934-35), Miller (1935), Pastore (1952), Rothans and Worchel (1960), Kregarman and Worchel (1961) and many others.

As far as age-variable is concerned adolescents are found to be more aggressive than adults. This may be due to the fact that adults belonged to more educated level than adolescents. They may have developed greater internal control or ego-strength, which may enable them to control themselves and restrain over the disrupting emotional reactions (aggression) they might have to frustration. Educated individuals have higher "self-esteem" and more tolerance for frustration. As Berkowitz, *et al.* (1952) point out that several experiments have demonstrated a relationship between self-esteem and aggressive behaviour.

The influence of sex-variable on reactions to frustration has been investigated by many psychologists, such as Janis and Field (1959), Sears and others (1957) Berkowitz and others (1952), Maier (1949), Lansky, Crandall, Kagan and Barker (1961). All of them agree with the present finding, that woman are less aggressive as compared to men. Both learning and biological factors seem to play some part in producing this difference.

As pointed out by Berkowitz (1962), Allisen and Hunt (1959), Lower-class (status) boys do exhibit more open and unrestrained aggression, is true in the present case also. Such a difference may arise in part from different disciplinary training given by the parents.

Different social milieu and training should have influenced the reaction patterns of rural-urban subjects also. But in the present case there is no significant difference between the two. It is, perhaps, due to the fact that rural subjects were not strictly confined to the rural areas.

Besides residence-variable, religion-variable is also ineffective in this case. There is no alteration in the Hindu and non-Hindu reactions.

Stafford and Hsu (1948), Sherman and Jost (1942) and Marquart

(1948) have studied the relationship between reaction patterns and personality. She found extroverts as inclined to be aggressive, but not fixed under frustrations. Sherman and Jost found neurotics apt for being easily aroused. In another study, Zander (1944) found aggressive subjects as accompanied by fewer "neurotic mannerism". In the present case, aggressive responses is highly related with neurotic personality. Extroverts are found to be avoiding aggression to some extent.

The present study also serves the purpose of further validating the Cohen's (1955) work on 'Ideal-Actual' variable. This may be called the ideal-actual distinction. By 'Ideally' is meant the socially acceptable or socially circumscribed response as opposed to what one would actually do, regardless of social norms. It studies the difference as to how the subjects actually behave in a frustrating situation, as compared with what 'ought' to have done. Since Indian society discourages open aggression in its child-rearing patterns, it would seem that a person would under-emphasize aggression as a response to frustration when normative standards are held before him. The results provide strong support for this hypothesis.

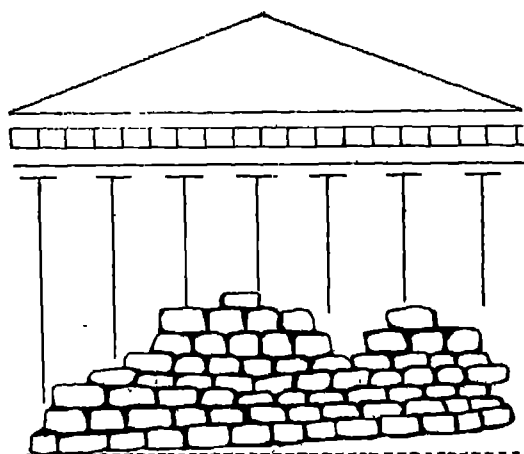
The present study provides some insight into the reaction patterns of the students and the role of certain variables governing the reactions. The analysis of variables may be useful in modifying the reaction patterns of the individuals. The reservoir of aggressive energy should be drained in order to reduce violence. The results provide data for studying cultural differences, and comparing the reaction patterns of different countries.

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Research Notes

A Paired Microsystem Model of Microteaching for Use without Audio-Visual Gadgets

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Most of us, who have been initiated in microteaching but are working in the developing tropical countries, are confronted with the problem of the effective use of this revolutionary technique. In some special situations, the technique of microteaching is not only desirable but appears to be the only way to rescue the outdated and clumsy teacher-training methods from self-consumption. The author feels that the current teacher-training practices in India are non-inspiring, dull and time-consuming. The paucity of vocational training and other outlets have made the university degrees the most sought-after bread-earners in India. It is still comparatively easy to get a teaching job in a school provided one holds a Master's degree in a specialized area and a Bachelor's or Master's degree in education. These degrees in education have become some sort of essential appendages. Many mushroom teacher-training colleges have come up and the system seems to have lost control over itself. In such a situation the time-saving and well-tested technique of microteaching may prove extremely useful only if it can be liberated from its halo of costly and glamorous hardware.

IN THE present paper the author has endeavoured to build a new model of microteaching which comes very close to the original Stanford model (Acheson, 1964) and is perhaps an improvement over Malawi microteaching model of Lawless (1971).

Essential and Non-essential Components of Microteaching

McKnight (1971) defines microteaching as 'a scaled down but realistic classroom context which offers a helpful setting for a teacher (experienced or unexperienced) to acquire new teaching skills and refine old ones'. This is achieved by reducing the classroom complexity in terms of pupils and length of lessons and providing trainees with a self-feedback on their performance. Brown (1971) also defines microteaching as a 'scaled down teaching encounter'. Stone and Morris (1972) feel that microteaching is just a generic title given to a group of tighter analytical methods providing a new type of feedback. Allen and Ryan (1969) and Griffiths (1972) accept the dynamic nature of this new educational tool which has yet to unfold its full power and range of application. This microteaching cycle, according to Brown (1971), follows a repeating sequence of Teach-View-Critique stages.

In spite of the inherent plasticity of the concept, it is still possible to structure it in terms of (i) scaled down class time, (ii) scaled down class size, (iii) scaled down teaching content, and (iv) post-microlesson self-feedback. If we stick to the independent components, only (i), (ii) and (iv) stand out as independent while (iii) appears to depend upon (i). Earlier, Bush (1968) suggested that one of the distinctive features of microteaching is the opportunity it provides for immediate and individual diagnostic evaluation of teaching performance. It is, therefore, possible to select the essential components of microteaching as (i) self-feedback, (ii) scaled down class time, and (iii) scaled down class size but the heart of microteaching seems to lie in the feedback component.

In an ideal situation, this self-feedback is provided by video-recordings of micro-teaching session. It is now commonly agreed that video-recordings enhance the effectiveness and flexibility of microteaching (Goodkind, 1968; Voth, 1968; Kallenbach, 1969). However, the model developed in this paper

* The author is grateful to the Education Centre, The New University of Ulster, Northern Ireland, for giving an opportunity to study microteaching as a Diploma student. She is also indebted to her teacher Dr. G. A. Brown, now at Nottingham University, for many inspiring discussions on microteaching. The conclusions, ideas and opinions, expressed in the article are, of course, entirely those of the author.

excludes the use of video-recordings and attempts to come as close to the ideal situation as is possible.

The Proposed Model

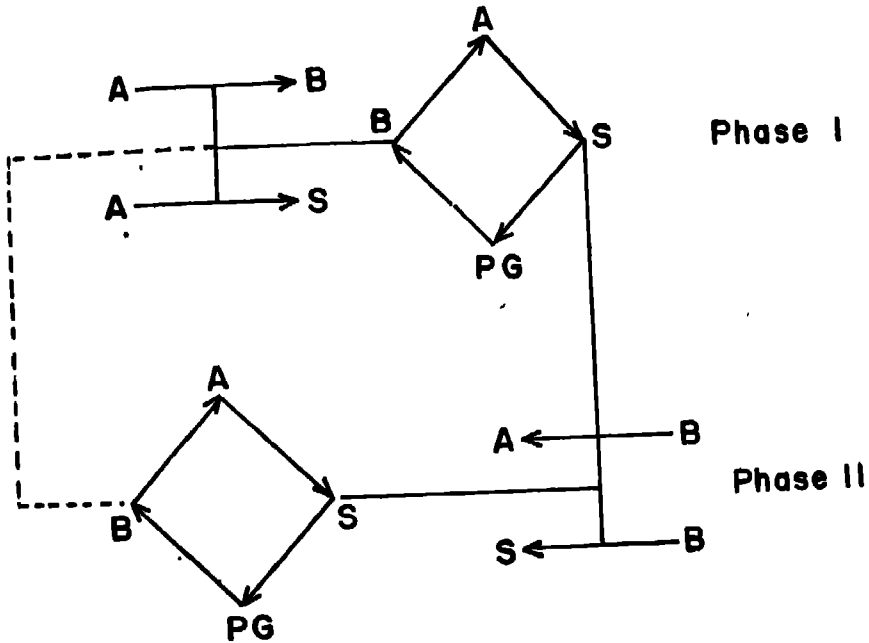
The model as proposed in this paper commits itself to maintain the essential structure of microteaching without diluting the intensity of the feedback. It develops its main argument from a re-evaluation of the evaluative part of the microteaching. One widely used evaluative instrument is S.T.C.A.G. (Stanford Teacher Competence Appraisal Guide) which divides teaching into *observable* skills like stimulus variation, set induction, closure, silent and non-verbal clues and reinforcement skills. In a given pattern of teaching, these skills may either be (i) totally absent or totally present, (ii) partly absent and partly present.

These skills differ from one teacher to the other in their relative intensities and frequencies in a given period of time. Since these skills are *observable* and *analysable* entities and they also are the universal principal constituents of teaching, the self-feedback at the *individual* or *organismal* level may be desirable but is not necessary. Individual 'A' can observe the microteaching of the individual 'B' as he will observe his own teaching if provided with a video-recording. In the same manner 'B' can observe the microteaching of 'A'. It is, therefore, possible to create a *microsystem* of two (paired) trainees 'A' and 'B', working in terms of *intra-systemal* feedbacks from A to B and from B to A. It is obvious that for such a Paired Micro-system (PMS) self-feedbacks in the form of video-recordings are superfluous as the feedbacks are *intra-systemal* and the system is self-sustained. A repeat performance by A or B may produce the 'action re-play' effect, assuming that the gap between the first teaching and its repetition will neither increase or decrease the existing teaching skill of A or B. The operational details (see figure on next page) of this model are as follows:

1. PMS is constituted by two trainees 'A' and 'B'. One supervisor (S) and the micro-class (MC) of 4-6 individuals are other components.
2. The suggested scaled down time is 10 minutes for one micro-class.
3. 'A' teaches MC for ten minutes while B and S observe from an observation window. B and S independently evaluate the teaching of 'A' on the basis of S.T.C.A.G.
4. A, B, S and MC interact on the basis of evaluations made by B and S. S analyses and interprets the teaching situation for the benefit of A and B. The same sequence is repeated with B as the teacher and A-S as observers. These two sequences constitute the two phases of

A PAIRED MICROSYSTEM MODEL OF MICRATEACHING

PMS microteaching. The two phases together make one PMS microteaching cycle.



A cycle of paired microsystem microteaching

A : Paired student teacher

B : Paired student teacher

S : Supervisor

PG : Peer group

-- : Lesson flow

5. The *intra-systemal* feedbacks and A-B-S-MC interaction can be symbolized as follows :

First Phase *intra-systemal* feedback

A → B

↓

A → B

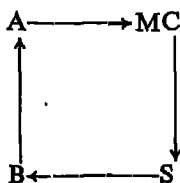
B → A

↓

B → S

Second Phase *intra-systemal* feedback

Inter-phase interactions



6. Pre requisites are some training in the identification of teaching skills and use of S.T.C.A.G. In the beginning one or two PMS microteaching cycles may be devoted to these requirements. This can be called as 'activation phase'.

PMS v. Stanford Model.

1. Both the models scale down the class time and class size.
2. Both rely upon some sort of feedback. In the Stanford model the feedback is non-simultaneous and organismal (i.e. self-feedback) while in PMS the feedback is simultaneous and intra-systemal.
3. In both the models, the supervisor or the tutor has to work in a real teaching situation.
4. The intra-systemal feedback of PMS is perhaps more objective and without bias in comparison to self-feedback which may result in some sort of self-glorification in the minds of some trainees. This may interfere with the supervisory suggestions.

A comparison of PMS model with the original Stanford model, therefore, reveals that PMS retains the essentials of microteaching and maintains the intensity of the feedback. However, the classroom simulation is not so perfect in PMS model but some clever adjustments in the classroom setting may reduce this error.

PMS v. Malawi Model

The Malawi University microteaching model as described by Lawless (1971) makes use of a simulated class in which the student-teacher, the tutor, and the observers leave the class, after a lesson session of 15 minutes, and discuss student-teacher's performance. Between teaching a lesson and re-teaching, the student-teacher spends approximately 15 minutes in discussion with the tutor and observers, followed by 30 minutes to revise the lesson plan.

A PAIRED MICROSYSTEM MODEL OF MICROTEACHING

1. The classroom simulation in the Malawi model is poorer as the tutor and three students constitute the micro-class. The direct presence of the tutor may create an extremely artificial situation. In India the tutor commands great respect and is taken to be the ultimate authority and, therefore, his presence in the micro-class may render the whole process of microteaching useless.
2. In the PMS model the supervisor behaves in the same manner as the observer-trainee. He is, for all practical purposes, just another trainee but with much more experience of identifying teaching skills. The subjective element as referred to by Perlberg (1970) is considerably reduced in PMS model.
3. The feedback is much more objective. The paired-trainee and the supervisor actually score the performance on a quantitative scale and compare their observations during the inter-phase period.

CONCLUSION

The proposed paired microsystem model appears to be an able competitor. Its strength lies in its operational simplicity, independence from video-type feedback and manipulatable elasticity. The model, however, needs experimental validation which alone can improve it in terms of specific local conditions. At the "University of Sagar, the author is currently busy in the standardization of this model to suit Indian conditions.

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Transformational-Generative Grammar : Assumptions and Implications

A Case for a New Model of Grammar

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TRANSFORMATIONAL-GENERATIVE GRAMMAR has established itself as one of the most vigorous and exciting movements in modern linguistics. Like Pike's tagmemics, Halliday's systemic theory and Sidney Lamb's stratificational grammar, it came as a critical reaction to the structuralist approach of the post-Bloomfieldians. However, as Frank Palmer remarks, generative linguistics is 'the most influential of all modern linguistic theories'.¹

The term 'transformational' came into prominence in 1957 when Noam Chomsky, Professor of Linguistics at the Massachusetts Institute of Technology, published his book called *Syntactic Structures*. The theory had already been foreshadowed in earlier works, particularly in the writings of his own teacher, Z. S. Harris, but Chomsky's is the best-known and so far the most highly developed system. His work has revolutionized linguistics and

has caused an upheaval in the world of cognitive psychology and the language-teaching profession. Many linguists, psychologists and educators have recognized his theory of language as one of the most significant developments in the study of language in this generation. One Edinburgh psychologist, for example, quite seriously compared him to Newton, as the initiator of a comparable upheaval in physics. Paul Roberts would rank him with Galileo and Freud and two other psychologists told John Davy, a correspondent of the *London Observer*, that their first encounter with Chomsky's work had the quality of 'a mystical experience'². These claims may seem exaggerated, but they do speak of the explosive effect of Chomsky's work. An attempt will be made here to discuss some of the basic assumptions and implications of his grammatical theory.

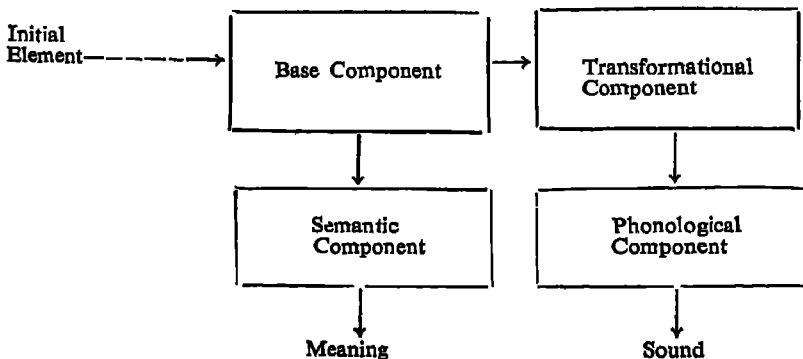
Chomsky defines grammar as 'a description of the ideal speaker-hearer's intrinsic competence'³. The grammar of a language, as conceived by him, is an idealized description of the linguistic competence of the native speakers of that language. It is 'a device that generates all of the grammatical sentences of (the language), and none of the ungrammatical ones'⁴. 'To generate', in this definition does not simply mean 'to produce', it refers to the 'creative' aspect of language and, secondly, implies its 'formalized' or 'explicit' nature. In fact, all native speakers of a language have a grammar represented in them which enables them to 'determine' all of the infinite number of sentences. Rules that 'generate' or 'determine' are actually generalizations about language, which permit the native speakers to evaluate the grammaticality of purely novel utterances.

Transformational-Generative (TG) theory stresses the 'rule-governed creativity' of the linguistic knowledge of the native speaker. Unlike animal communication systems, human languages are 'open-ended'. To prove this point to anyone who does not believe in the infinity of sentences in a language, we have merely to ask him to give us the longest sentence he can produce, and then add another adjective or relative clause to it. There is really no longest sentence in a natural language. As the speaker and the hearer of a language are finite organisms, their mental faculties must be limited. Using knowledge which is finite, they produce and understand, however, an infinite set of utterances. This infinity is a result of what is known in mathematics as 'recursion', the application of the same device over and over again.

In his *Syntactic Structures* Chomsky thinks of language as "a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements"⁵. The 1957 model of his grammar is based on the concept of 'kernel' sentences, which he drew from Harris. Kernel sentences are 'simple, active, (and) declarative', and all other sentences, Chomsky feels, are derived from them by means of 'transformations'. Broadly speaking, a trans-

formation is a rule that either introduces new elements into kernel sentences (e.g. adjectives, negatives), or rearranges the elements of a kernel sentence (cf. interrogative sentences), or does both (cf. passive sentences). The passive, interrogative and negative sentences, and sentences containing, for instance, adjectives, adverbs and conjunctions are thus more complex or 'sophisticated' than kernel sentences. Chomsky believes that the notion of 'phrase structure' is quite adequate for a small part of the language and that the rest of it can be derived by repeated application of a rather simple set of transformations to the string given by the phrase-structure grammar.⁶ Syntax, for him, is the core of a language, its organizing principle. He splits it into two parts : (a) a phrase-structure component (or base component), that pertains to kernel sentences, and (b) a transformational component, that generates non-kernel sentences. He also devises certain *morphophonemic rules*, that are necessary to account for irregular forms. The transformational rules (which are 'cyclically' ordered) operate after, and upon the output of, the phrase-structure rules, and without them the phrase-structure grammars 'will be so hopelessly complex.'

In *Aspects of the Theory of Syntax* (1965), however, Chomsky presents a more comprehensive and revised model of his grammar. The 1965 version of his theory postulates a three-component grammar : a syntactic component which consists of a 'surface structure' and a 'deep structure' ; a semantic component, which assigns a semantic interpretation to the 'deep structure', and a phonological component, which assigns phonetic interpretation to the 'surface structure'. The syntactic component is central, and the semantic and phonological components are 'purely interpretative'. Their relationship may be represented rather simplistically in the following diagram :



To put it simply, the syntax gives us information about the structure of a sentence, the phonology tells us how to pronounce it; and the semantics tells us what it means. The choice of a lexical item in a sentence is governed

by 'selectional restrictions' and 'strict sub-categorization rules.'

The notions of 'deep structure' and 'surface structure' are central to the Chomskyan theory of language. They correspond closely to the Humboldtian 'inner form' and 'outer form' of a sentence respectively. C. F. Hockett also talks of 'various layers of 'deep grammar' that lie 'beneath' the 'surface grammar'—the 'one layer' which is 'immediately apparent to the analyst'.⁸ For the same notions, Paul Postal uses the terms 'underlying structure' and 'superficial structure', respectively.⁹ The difference between 'deep structure' and 'surface structure' may be understood by comparing these two sentences :

- (a) *John is eager to please.*
- (b) *John is easy to please.*

The overt or 'surface' structure for both the sentences is the same (subject + form of 'to be' + adjective + infinitive), but they are not parallel in meaning: 'John' is a passive factor in the second sentence, but plays an active role in the first. The difference between the two sentences is to be found in their 'deep' structures. The 'deep structure' of a sentence is the abstract underlying form which determines the meaning of the sentence; it is present in the speaker's mind but not necessarily represented directly in his utterance. The 'surface structure' of a sentence, however, is its obvious manifestation.

TG grammar makes a fundamental distinction between competence and performance of the native speakers of a language. Competence is the speaker-hearer's knowledge of his language', and performance 'the actual use of language in concrete situation', the latter being 'a direct reflection of competence'.¹⁰ Campbell and Wales define competence as the ability to produce or understand utterances which are not so much grammatical but, more important, 'appropriate to the context in which they are made. Chomsky relates his own distinction of competence and performance to the Swiss linguist F. de Saussure's distinction of *langue* and *parole*.¹¹ The relationship between *langue* and *parole* is very complex and somewhat controversial. For de Saussure, *langue* is shared by all the members of a particular speech community, it is an institutionalized element of their collective consciousness. If the actual utterances of a group were examined, everything that was common to their speech would be *langue* :

It is a storehouse [says de Saussure] filled by the members of a given community through their active use of speaking, a grammatical system that has a potential existence in each brain.....For language is not complete in any speaker; it exists perfectly only within a collectivity.¹²

Parole, on the other hand, refers to elements that are not shared by all the speech community. The act of speech is distinguished by much that is the product of our personality, our temperament, or our physical incapacities and by those distortions in our speech which are not part of the system of language. *Langue* is a stable and systematic; *parole* is unsystematic due to 'memory limitations, distractions, shifts of attention and interest, and errors'.¹⁴ Both Chomsky and de Saussure are of the opinion that it is competence (*langue*) that the linguist must set out to describe. But Chomsky, unlike de Saussure, would not accept that competence could be described in terms of collective consciousness. Again, according to Chomsky, there is no point in looking at performance since much that needs to be said about competence cannot be observed there. For de Saussure, however, while *parole* might not be the object of the study, it does provide the data from which a statement about *langue* can be made. Chomsky's distinction between competence and performance has been severely criticized. M.A.K. Halliday, for instance, finds it 'unnecessary' and 'misleading'.¹⁵ Chomsky, however, considers all such criticisms 'unwarranted' and 'completely misdirected'.¹⁶

Another crucial point emphasized by Chomsky and his followers is the 'creative' aspect of language use. Linguistic behaviour, according to Chomsky, is 'stimulus-free and innovative'.¹⁷ He affirmed his viewpoint in his review of B.F. Skinner's *Verbal Behaviour*¹⁸, which appeared the same year as his *Syntactic Structures*, and in a radio discussion with Stuart Hampshire (which was printed in the *Listener* of 30 May 1968). 'No one has succeeded', he maintains in *Language and Mind* also, 'in showing why the highly specific empiricist assumptions how language is acquired should be taken seriously'.¹⁹ Language, he feels, cannot be acquired merely by reinforcement, associations, and generalizations. As an alternative to the behaviouristic point of view, he proposes the concept of 'innate ideas', viz. the inherited knowledge of the structure of language. Prompted by him, many scholars have begun to notice that the ability to acquire and use language is a much more extraordinary thing than they had realized.

Generative linguistics has thrown important light on the capacity and nature of the child's language acquisition. Dwight Bolinger discusses five stages of it :

- (a) the holophrastic stage,
- (b) the analytic stage,
- (c) the collocation stage,
- (d) the syntactic stage, and
- (e) the structural stage.²⁰

Lenneberg also talks of the phenomenon of 'resonance'—the capacity

for acquiring the language virtually as a native speaker²¹. The period of 'resonance' begins at about the age of 24 months and continues up to about the age of 12. Language acquisition is species uniform. There are no cases of normal human children who fail to acquire a language. All they need is sufficient exposure to the language concerned. The acquisition of language is also species specific. As Descartes remarks in his *Discourse on Method* :

It is a very remarkable fact that there are none so depraved and stupid, without even excepting idiots, that they cannot arrange different words together forming of them a statement by which they make their own thoughts, while, on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same.²²

The process is all the more remarkable for its comparative speed and perfection. Certain experiments were made about three years ago at the University of Nevada on a young female chimpanzee called Washoe. The two American researchers, Dr. and Mrs. R.A. Gardner, tried to teach her how to speak. After 31 months' training, they reported, Washoe had learned hardly sixty sign 'words'²³. This only goes to prove that the language trait of man is not a purely acquired behaviour, it is 'the result of an innate predisposition elicited by environmental circumstances'²⁴. The linguistic structure is innately specified, and the function of the child's exposure to language is more to activate his linguistic capacity than to shape it.

The concept of 'innate ideas' has some remarkable implications, the most important being the belief in 'language universals'. "A structural feature that is common to all languages is called a language universal".²⁵ As Chomsky has indicated, the content of every language shares with all languages a universality of patterning in the 'deep structure', and it is due to surface realizations that languages differ from one another in a multitude of details²⁶. Roman Jakobson and Morris Halle (*Preliminaries to Speech Analysis*, 1952) also maintain that the pertinent oppositions, observed in the languages of the world can be reduced to a limited number of binary oppositions, at least some of which are found in any linguistic system. Studies on 'language universals'²⁷ have concluded that all languages: (a) use nominal phrases and verbal phrases, the number of the former exceeding that of the latter; (b) have modifiers of two classes—adjectives and adverbs; (c) have ways of making adjective-like phrases out of the other kind of phrases (e.g. the man went→the man who went); (d) have ways of turning verbal phrases into nominal phrases (e.g. he went→I know that he went); (e) show at least two forms of interaction—intransitive and transitive—between verbal and nominal phrases; (f) have demonstratives of some sort as also ways of posing

questions, giving commands, and expressing negation; (g) have certain means of embedding and conjoining, and also certain agreement phenomena, and (h) have vowels, stops, fricatives, nasals, and perhaps glides and affricates. Roman Jakobson suggests a set of about forty phonetic features, out of which languages make their own selections. The grammar of a particular language, Chomsky feels, should be supplemented by a universal grammar. Only then will it be able to provide a full account of the 'speaker-hearer competence'.

It will not be out of place to mention here that a number of modifications have been introduced since 1957 into the TG system by Chomsky and others working on it. Chomsky's alteration in his theory in *Aspects* has been referred to earlier. One of the most obvious differences between the two models is the change from the earlier emphasis on Kernel sentences. All the transformations in the 1965 model are obligatory. The other major innovations are the semantic component and lexicon. Formerly he did not lay sufficient emphasis on semantic considerations, maintaining that syntax is prior to semantics. In a paper entitled "Deep Structure, Surface Structure and Semantic Interpretation", he described a 'semantically based' grammar as nothing more than a 'notational variant' of the TG theory outlined in his *Aspects*. His disciples, such as Chafe, Lekoff, Ross, Fillmore and McCawley, however, have advocated a 'semantically based' model of TG grammar. McCawley, for instance, has proposed that semantics be deemed prior to syntax. And Fillmore has refuted the view that 'case' relationships are 'surface structure' realizations; they are, to him, 'semantically relevant syntactic relationships.'²⁸ Chomsky, it may be added, has himself modified his view of the relationship between active and passive sentences, and has proposed that even 'surface structure' may be relevant to some aspects of meaning. Moreover, some of his followers have also envisaged possibilities of further development in the TG model. Lekoff suggests that verbs and adjectives can be collapsed into one category; and Kiparskys give a new analysis of complementation. The version presented in *Aspects* nevertheless remains, to quote Chomsky, 'the basic predicate in terms of which transformational grammar is developed'²⁹.

Chomsky does not think that his theory, for all its theoretical worth, is applicable to language teaching in any obvious and definite way. In his paper "Current Issues in Linguistic Theory" (1962), he expresses his doubts about 'the significance, for the teaching of languages, of such insights and understandings as have been attained in linguistics.'³⁰ Linguistics, he thinks, has not achieved so far a level of theoretical understanding that may enable it to support a 'technology' of language teaching. He reiterated similar views at the North-East Conference on the Teaching of Foreign Languages held in 1965. A few teachers and scholars also feel that this model of grammar is

both esoteric and forbidding. C.F. Hockett, for example, points out in *The State of the Art* that generative grammar has been caught in the fatal trap of taking its theoretical entities for real entities, like a pathologist taking his slides and microscopes for the bacteria under inspection. Wilga M. Rivers, too, feels apprehensive of TG grammar. She remarks: 'With his continued emphasis on creative and innovative use of language, Chomsky is likely to lead us astray in the teaching of foreign languages by fixing our attention on a distant rather than an immediate goal'.³¹ Some persons even went to the extent of ridiculing this grammar. One of them, for example, had the audacity to ask 'How deep is the deep structure?' And there was a fashion a few years ago to refer to the young exponents of this approach as 'mitniks' (after MIT).

TG grammar may have its own weaknesses and limitations, for, as Sapir remarks, 'all grammars leak'. But there can be no denying the fact that some of its aspects have a significant relevance for language teaching. It is proved by the success of a course conducted by Owen Thomas for 30 students in the summer of 1961 at Indiana University. His experience convinced him that 'certain deductions from the theories of Chomsky could be applied systematically to the teaching of grammar'.³² It will, however, be useful to distinguish, as Chomsky himself has done, between a linguistic and a pedagogic grammar. A linguistic grammar, as Chomsky sees it, aims to discover and exhibit the mechanisms that make it possible for 'a speaker to understand an arbitrary sentence on a given occasion', whereas a pedagogic grammar attempts to provide the student with the ability to understand and produce such sentences.³³ Some of the transformations that can easily be taught to students are the obligatory ones such as affix attachment, negative placement, and those which require the 'deep structure' to be marked for their operation, e.g. forming of questions from statements, changing of active into passive voice, imperative transformation, and so on.

Someone might ask: What is the need of TG grammar when all these sentence-patterns can be easily taught following a traditional model? In fact, there is no contradiction between the formulations of TG grammar and those of traditional grammar. As Chomsky himself suggests, "The study of generative grammars is . . . a natural outgrowth of traditional descriptive linguistics".³⁴ TG grammar is a new way of looking at some old and traditional ideas concerning language, which, by and large, are 'basically correct'.³⁵ The traditional grammars, however, were deficient in one significant respect: they did not touch upon many of the basic regularities of a language. This is one score on which TG grammars have an edge over traditional grammars. Although transformations may not be necessary in a grammar, their use considerably simplifies it. TG grammars have a better explanatory power; and they are 'incomparably greater in explicit coverage

than traditional or structuralist descriptions',³⁶ Further, as Chomsky himself claims, 'one of the advantages of a transformational grammar is that it enables us to relate superficially distinct sentences and distinguish superficially identical sentences'.³⁷ Another benefit of this model of grammar is that it helps us in resolving the structural ambiguity of such sentences as *Flying planes can be dangerous* or *The policemen were asked to stop drinking about nights*, by bracketing their immediate constituents together in 'layers' of 'phrases'. It also helps us in determining the grammaticality or acceptability of sentences. Another major advantage of the TG model over traditional one lies, according to T. Grant Brown, in the 'formal apparatus' it provides.³⁸ The generative theory has provided us with generalizations that had previously gone unnoticed. It has also given us the only logical explanation currently available for the intuitive linguistic sense which the native speakers of a language possess. Lastly, TG grammar is probably the most 'powerful' grammar—'powerful' because it accounts for more 'facts' of language and accounts for them more 'correctly' than any other model.

Talking of the work done by transformational generative linguists, Chomsky once said :

At present the field is in considerable ferment, and it will probably be some time before the dust begins to settle and a number of issues are even tentatively resolved.³⁹

It is more than 17 years since *Syntactic Structures* appeared, and the dust has already started settling down. A notable effect of Chomsky's generative linguistics has been to bring to psychologists' attention the crucial importance of linguistic creativity. In England TG grammar is being readily accepted today, and it is the most popular model in America. About Chomsky's impact David Crystal remarks : It would be impossible *not* to follow Chomsky on many of the fundamental theoretical issues he raises. It is certainly impossible for a linguist these days to avoid being influenced by him'.⁴⁰ TG grammar, however, did not make much headway in other countries. It has practically a negligible impact in our own country, for example. The reasons are not difficult to suggest. Chomsky's works are difficult. They are addressed to fellow-linguists and presuppose a certain acquaintance with formal disciplines—especially symbolic logic—which even linguists do not normally possess. Then, TG grammars suffer in comparison with traditional grammars which have so much by way of information; they are not so much interested in facts as in their explanation. This explains why there is so little awareness and appreciation of transformational analysis in India. A few works by Indian scholars that deserve mention in this context include the Ph.D. thesis on the

grammar of Hindi by Mrs. Yamuna Kachru (who is presently on the staff of Illinois University, and has published a number of articles on the subject) and P. Kodandaraman's doctoral dissertation entitled "A Contrastive Analysis of Tamil and Telugu" (1969). A considerable amount of work, however, remains to be done before we can decide the success (or failure) of TG grammar in India. If it is a success, it will be very helpful in psycholinguistic analysis, translation (including machine translation) and language teaching. The model is worth a try in Indian schools and colleges, where the structural method of teaching grammar has miserably failed and where practically no systematic grammar teaching is done today. The TG model, which is quite close to the traditional model, can be particularly fruitful in the Indian context, which had an illustrious tradition of teaching language by the 'traditional' method.

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Some International Aspects of Educational Planning

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HUMAN CAPITAL, its planning and effective utilization need to be approached in view of the fact that a large percentage of highly skilled personnel are trained abroad and they are more mobile as compared to unskilled labour. The

economic welfare aspects of international migration are mentioned in passing as they have been discussed in detail elsewhere¹. Our main objective here is two-fold :

- (i) To determine the costs and benefits of foreign training in view of its influence on outmigration of high-level manpower, both trained at home and abroad, and suggest a way of incorporating this element into the educational planning.
- (ii) To attempt an evaluation of outmigration as an indicator of imbalance between human capital production and the demand for its services in an economy.

In addition, we will also look at the costs and benefits of accepting foreign students in the educational system.

Training abroad is one of the many possible determinants of outmigration, such as the net earning differentials, social and actual affinity with the recipient country, imbalance between production and demand for the services of human capital. The other socio-economic factors in the losing country can be prejudice based on caste, creed, race, religion or region, stifling bureaucratic rigidities, pay structure and opportunities for advancement or lack of a social milieu conducive to intellectual activity. Sometimes the social background of the qualified persons is such that they are aliens in their own societies once they move out of their immediate social circle. They are more of a part of the advanced societies. As their concentration in a few urban areas creates intense competition among themselves, their upbringing and social orientation encourages them to go abroad. This point is illustrated by the distribution of doctors between urban and rural areas in India. Approximately four-fifths of Indian doctors live in towns while four-fifths of the population lives in villages. There is one doctor available for 5,800 persons in the country on an average, while these figures are 1,500 and 23,000 for towns and the countryside respectively². In the country each development 'block' with an average population of about 80,000 is served by a Primary Health Centre including a Family Planning Centre with a normal establishment of two doctors; 16 per cent of those centres which are vital for population control have no doctors. In 1965 about 6 per cent of the total stock of Indian doctors lived abroad. The return of these doctors with additional qualifications and advanced training simply reinforces the urban bias and accentuates the difference between facilities available for urban and rural areas. So the problem cannot be analyzed in terms of simple income differentials or supply and demand. The solution probably lies in a recruitment policy which encourages students from the countryside to enter medical schools, who will have an emotional attach-

ment with the areas they come from. Unlike their urban colleagues, they will not be aliens to the rural environment. However, it needs to be ensured that the academic environment does not distort their values and alienate them from the countryside. The existence of a high level of unemployment in certain skill categories and the shortage of others is a classic example of misallocation of resources in the educational sector. In such a situation brain-drain is a symptom of bad planning rather than the cause.

In this context, the effects of net earning differentials on the motivation to emigrate, remains an important, though a secondary factor. Sen⁴ in his study of migration of engineers, natural scientists, doctors and social scientists to the U.S. in the year 1966-67, from 51 developing countries, found that the pattern of immigration did not relate either to income differentials or distance between the country of origin and the U.S. or the quota system. Sen's explanation for the lack of apparent influence of earning differentials has some relevance. According to him, the difference is so big between earnings in the U.S. and the developing countries that this variable becomes meaningless in an econometric analysis. The same explanation applies to the variable which, according to Sen, indicates the cultural and social proximity. This is not surprising either, because in spite of cultural and social differences between the developing and advanced countries, the persons who migrate are part of 'social and cultural islands' in most of the developing countries closely associated with the advanced countries. Since most of the developing countries are more or less equally affected by this cultural dichotomy, it will be meaningless to use it as a variable in the regression equation. The recruitment policy of the entrants to professional institutions, as suggested above, may break this link and make costs of adjustment abroad for emigrants very high, thus checking the outmigration flow.

Sen, in his study, showed that the number of students graduating in the country of origin does influence the pattern of immigration into the U.S. but the most important explanatory variable was found to be the number of students from the country in question studying in the U.S. All the variables were scaled by the population of the country of origin. The number of students studying in the U.S. explained 95 per cent of inter-country variation in immigration of natural scientists and the corresponding figures for social scientists and engineers are 91 per cent and 92 per cent respectively. In the case of doctors and dentists this figure is 34 per cent and is over 50 per cent when the variable representing the number of students graduating at home is added. The close relationship between emigration and the number of students studying abroad in the case of developing countries can be explained as follows.

A number of students may not return home either because they have

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changed their mind after acquiring their qualifications or they had decided to stay abroad before they left home. In the latter case, going abroad as a student is just a convenient way of emigrating. They may also feel that the type of training they have acquired is not quite suitable to the conditions in the home country. This may prompt them to stay abroad. But another factor relevant to educational planning is that these persons act as sources of information to their friends, relatives and former colleagues back home which may influence emigration of personnel without foreign training. So it seems that trained and untrained emigrants complement each other in the pattern of emigration.

The circumstances under which one is more important than the other should be examined for policy purposes. One way of looking at this problem is to classify trained manpower by locus of education and the locus of employment.

		LOCUS OF EMPLOYMENT	
		Home	Abroad
Locus of Education	Home	I	II
	Abroad	III	IV

For planning purposes, initially we can identify the relationship between I and II categories in the above Figure, while ignoring the influence of III and IV categories of manpower. Similarly the relationship between III and IV categories of manpower can be established. This will give us only very broad indications. Actually the four categories are interlinked. The determination of incremental ratios of emigration to study at home and of emigration to study abroad based on multiple regression may be more appropriate. These ratios along with qualitative information about emigrants such as age, marital status, source of finance, type and level of training can be used in educational planning.

Application of Cost-Benefit Analysis to 'Training Abroad' and the Acceptance of Foreign Students

There are both advantages and disadvantages in training personnel abroad. The principle of comparative costs of production goods in general

can be applied to the field of skills as well. If the demand for certain types of human skills is relatively small, a country may find it cheaper to get personnel trained in those skills abroad rather than to create the necessary facilities at home. As in international trade, if the flow of 'trainees' and immigrants is in both directions, there is no problem. There is a 'balance of brains' in such a situation. The problem arises if a country suffers a net loss of high-level manpower or the training flow is only in one direction. A country which receives more students from abroad than it sends out, needs to prepare a detailed inventory of social benefits and social costs of this policy. The benefits could include the capital embodied in non-returnees, the contribution to research by foreign students, and the expenditure they incur during the course of their study. There are also intangible benefits such as cultural influence, and development of links which may help to enhance political and economic ties in future. In addition, their presence provides an easy opportunity for domestic students to acquaint themselves with social and cultural traits of various overseas groups if they are interested. The costs are obvious in terms of providing a place for study and the increased demand for social services, etc.

In the case of a country which sends out more students abroad than it receives, benefits lie in the difference between the social cost of training at home and the social cost of training abroad. The underlying assumption is that students trained in both cases are equally productive. If workers trained abroad are relatively more productive, then benefits have to be adjusted upwards for the difference. But one has to take into account the costs of foreign training on emigration of both foreign trained personnel as well as those trained at home. By training its personnel abroad, the country in question loses the know-how which is a by-product of the training process. This could be especially important where technology has to be adapted to local conditions. Moreover, this technological factor has a bearing on the type of training required. In other words, the course contents are to be oriented to meet these specific needs. This in turn would reduce the risk of potential outmigration.

We have pointed out briefly some international aspects of national educational planning. They have been explicitly ignored in all the planning exercises which have been undertaken in this area so far.

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A Study of Adjustment of College Students in Relation to Anxiety

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THE PRESENT STUDY was undertaken to investigate the adjustment of college students belonging to high anxiety and low anxiety groups in relation to sex. With this purpose in mind, two groups—a high anxiety group and a low anxiety group—were formed out of a total sample of 300 subjects from five different colleges of Patiala District studying in the undergraduate classes. They were administered Dutt's Personality Inventory for measuring anxiety. On the basis of Q3 and Q1 scores on anxiety, two groups were formed. Subjects with scores more than Q3 scores were taken in the H.A. (High Anxiety) group and subjects with less than Q1 were taken in the L.A. (Low Anxiety) group. In this way, 79 subjects (38 boys and 41 girls) fell into the high anxiety group and 76 subjects (42 boys and 34 girls) fell into the low anxiety group. The final sample consisted of 80 boys and 75 girls.

To measure adjustment, subjects belonging to the two anxiety groups were administered Saxena's *Vyaktitva Parakh Prashnavali* (MA-62). The mean, SD and critical ratios of adjustment scores of high and low anxiety low anxiety groups were calculated. These are given in Table 1.

From Table 1 it is quite clear that the subjects of the I.A. group were found to be better adjusted as compared to the subjects of the H.A. group; the mean adjustment score in the case of L.A. is 69.31 and the same in the case of H.A. is 52.22. This difference was found to be highly significant as statistically as the C-ratio was found to be 7.8 which is significant at .01.

TABLE 1
MEAN, SD AND C-RATIOS OF ADJUSTMENT SCORES OF HIGH AND
LOW ANXIETY GROUPS FOR THE TOTAL AND SEX-WISE SAMPLE

	HA	LA	High Anxiety Group		Low Anxiety Group	
			Boys	Girls	Boys	Girls
N	79	76	38	41	42	34
Mean	52.22	69.31	53.92	50.6	70.73	67.55
SD	14.00	13.30	13.60	13.90	15.50	9.90
SE	1.57	1.53	2.20	2.17	2.39	1.54
$\bar{\sigma}_{dm}$		2.19		3.09		2.84
CR's		7.8*		1.07		1.12

*Significant at .01 level.

level. It means that persons with low anxiety are better adjusted as compared to persons with high anxiety. The above table also makes it clear that for both levels of anxiety, boys were found to be better adjusted than girls, the mean scores for boys and girls being 53.92 and 70.73 and 50.62 and 67.55 respectively. But these differences were not found to be statistically significant as the critical ratios were found to be equal to 1.07 and 1.12 respectively. This means that there are no statistically significant differences in the adjustment of boys and girls either for the high or the low anxiety group.

The differences in mean scores for the five aspects of adjustment were also measured for both groups. The means, SD and critical ratios on five aspects of adjustment of subjects belonging to the H.A. and L.A. groups were also found out (Table 2).

TABLE 2
MEAN, SD AND C R'S OF FIVE ASPECTS OF ADJUSTMENT
OF H.A. AND L.A. SUBJECTS

Aspects of Adjustment	High Anxiety Group		Low Anxiety Group		Critical Ratios
	Mean	SD	Mean	SD	
(A) Home	8.94	3.12	10.87	2.79	4.02 ($P < .01$)
(B) Health	8.98	2.97	12.13	2.78	7.32 ($P < .01$)
(C) Social	13.96	4.44	16.94	4.41	4.25 ($P < .01$)
(D) Emotional	13.84	5.52	20.5	5.31	7.74 ($P < .01$)
(E) College	6.91	2.34	8.94	2.94	4.95 ($P < .01$)

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As Table 2 indicates the differences between the adjustment of subjects belonging to the two anxiety groups were found to be statistically significant with respect to all the five aspects of adjustments. The CRs were found to be 4.02, 7.32, 4.25, 7.74 and 4.95 in case of home, health, social, emotional and college adjustments respectively, each of which is significant at .01 level. These results confirm the previous findings that if there is a significant difference in the total adjustment score between the two anxiety groups, there should also be significant differences between these two groups on all the five aspects of adjustment. The mean scores in the case of the L.A. group are high on all five aspects of adjustment as compared to the same of the H.A. group.

The relationship between the adjustment scores and anxiety scores have also been found out. The correlation coefficients obtained between the two on a total sample of 300 subjects were found to be equal to .51 and on a sample of 155 subjects — .59. It means that there is a negative correlation between adjustment and anxiety. In other words, it can be said that adjustment and anxiety are negatively correlated, i.e. subjects who are suffering from high anxiety have a low level of adjustment and others who are well adjusted have less anxiety. Those who are maladjusted have high anxiety and less anxious persons are well adjusted.



How Headmasters Solve Students' Problems : An Investigation

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HOW HEADMASTERS solve students' problems is a real problem and one realistic way to get a dependable answer to the question is to talk with the headmasters who dealt with such children. From them we can gain a

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first-hand impression of how headmasters can help in solving students' problems. Such experiences can help headmasters to make a wiser personal decision. I have attempted to provide an appropriate answer to the question by taking advantage of the experiences of a good number of headmasters.

I collected the information for the investigation with the help of 85 student-teachers of the B. Ed. (Basic) class of P.G.B.T. College (now named as College of Education), Chhatarpur (MP) during the months of December 1965 and January 1966.

The study concerns 87 boy students who had problems. These students belonged to 87 institutions out of which six were primary schools, 54 were middle schools, 22 were higher secondary schools, and five were intermediate colleges. These institutions belonged to the following 14 districts of M. P. and U. P. :

M. P.—Bhind, Chhatarpur, Datia, Guna, Murena, Shivpuri, and Gwalior.

U. P.—Etaha, Itawa, Jalon, Jhansi, Kanpur, Mainpuri, and Mathura.

Data

The following techniques were employed by headmasters to solve students' problems :

1. Headmaster favoured the teacher against the child.
2. Sent a report about the child to his father.
3. Asked the student to beg to his teacher for pardon.
4. Reduced the punishment proposed by the teacher.
5. Kept himself informed about the student's problems with the help of students living in his neighbourhood.
6. Ordered the student not to attend the class for a number of days.
7. Appealed to nobler motives.
8. Established personal relationships with the child.
9. Asked the child to behave well in view of the good name of his father and family.
10. Helped in creating understanding between the students who were the leaders of two different (rival) boys' groups.
11. Gave a warning to the child.
12. Gave corporal punishment to the child.
13. Treated the child with love and sympathy.
14. Arranged talks by teachers on 'Ill Effects of Indiscipline among Students'.

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15. Met the guardian of the child.
16. Removed misunderstanding between the teacher and the child's father.
17. Arranged a drama on 'Ill Effects of Misbehaviour by Students' in the presence of teachers, students, and parents.
18. Advised the child's father to admit his son in some other school.

Interpretation of the Data

The techniques employed by headmasters to solve students' problems suggest that the headmaster has to deal with many people in trying to solve students' problems. His techniques seem to divide themselves into the following four main groups :

- | | |
|---|-----|
| (i) Those concerning the headmaster and the teacher. | 12% |
| (ii) Those concerning the headmaster and the parents. | 16% |
| (iii) Those concerning the headmaster and the child. | 44% |
| (iv) Those concerning the headmaster and the community. | 8% |

(i) The Headmaster and the Child

It is clear from the above groups that most of the techniques (44%) involved the child himself. While dealing with children who had problems the headmaster had to employ various techniques and in every case he had to take recourse to more than one technique.

Headmaster kept himself informed : The headmaster realized the importance of keeping himself informed about all such pupils. In achieving this objective the requested teachers to inform him from time to time about these pupils. A few headmasters kept a record of all such cases including home conditions of the child, problems found in the child, measures taken by the teacher, the effect of each technique so employed, further action suggested, and the progress in the case.

In some cases, it was noticed that the headmaster had close contact with some students, especially those living in his neighbourhood. He often asked these pupils to visit his house and there he got the information from them indirectly through informal talk about the activities of the students with problems. In serious cases, the headmaster had to establish a personal relationship with the child to know more about him.

Headmaster showed kindness : It was experienced by Headmasters that most of the problems could be solved by establishing personal relationship with the child himself, by treating the child with love and sympathy,

by showing kindness, and by appealing to nobler motives. In one case, the headmaster appealed like this :

Your father is a doctor. Your brother is an engineer. Your family is the most respected one in the village. If you do not behave well, you will do harm to the good name of your father and the family. What will people speak of you !

In some cases, the headmaster reduced the punishment proposed by the class-teacher. But in doing so, the position of the teacher was upheld. The child was made to feel that the punishment could be reduced only if the teacher agreed to that.

Headmaster took recourse to punishment : At times, the headmaster found it desirable to impose some punishment for an offence. He gave warning to the child in one case, while in the other, the child had to be suspended from the class for some days. In severe cases, corporal punishment was considered necessary. In one case, the headmaster wanted to turn the boy out of the school for ever, and to do so he met the father of the child and requested him to admit his son in another school.

Here, it seems advantageous to mention that the headmaster did not keep in mind certain important facts while dealing with such children. In actual practice, the educator has to face the individual as he is and to discover what reward or punishment or appreciation will make the child conform to the conduct approved in the school. The same reward or punishment may not be effective with all. The whole programme of rewards and punishments must be so organized that ultimately inner motivation—good conduct or work for its own sake—should become the motivation force in the school. Rewards are a more desirable motivation than punishment. Before imposing any punishment, it is desirable to know the cause of the offence. The headmaster must always remember that punishment is always a means and never an end in itself, particularly in an educational institution. And two ends of punishment are : to prevent recurrence of the offence, and to reform the offender. Stern measures should be used only in the last resort. Expulsion of a student and corporal punishment are an expression of failure on the part of the administrator. Therefore a good headmaster will avoid both.

The best government is the one that governs the least. The order based on self-discipline is the best one. The headmaster should realize that discipline is not something that a teacher maintains, but is something which he helps children to attain.

(ii) *The Headmaster and Parents*

Sixteen per cent of the techniques involved the headmaster and the parents. In another study by the author, it was found that more than 50 per cent of the problems were caused by the child's home. It is, therefore, imperative that unless the home supports the school, the headmaster cannot succeed in his educational programmes.

Headmaster informed and met the parent : When the class-teacher failed in his attempts, he reported the matter to the headmaster who first tried to solve the problem within the school. But when he was not successful, he reported the matter to the child's parent. When reports served no useful purpose, the headmaster decided to see the parent. And what did he report? Generally, it was a complaint about the child.

But some headmasters were tactful. They consulted the parents about little problems before they became big. They utilized every opportunity to get acquainted with parents through P.T.A., school committees, and parent-teacher conferences. The headmaster also made use of the outside civic and social events in the community to get acquainted with parents.

Headmaster acted both as a postmaster and a judge : Most of the teachers thought of working with parents as the sole job of a headmaster. When some report was to be sent to a parent, it was actually sent through the headmaster. The headmaster generally had nothing more to add to the report prepared by the class-teacher. The headmaster took initiative only in serious cases. Again, when any report was received from some parent, it was delivered by the headmaster to the class-teacher.

Like most people, teachers enjoy talking about unusual parents. They speak of the parent who thinks that the teacher should devote all his time to his child. Teachers do not like the parent who always defends his child. At one time or the other, teachers get sick of 'parental jaw' and seem to agree that 'parents are the last people on the earth who ought to have children'. On the other hand, some parents feel that 'teachers are the last people who ought to have taught children.

Whenever such a situation arose, the headmaster had to contact both the teacher and the parent separately, and thus tried to wipe out the misunderstanding between the two. Sometimes he had to give a judgement on the dispute. While dealing with such situations, he realized that working with parents was not only a part of teaching but also a part of educational administration.

(iii) *The Headmaster and Teachers*

In 12 per cent of the cases, the headmaster had to take into account the

teacher concerned or he consulted more than one teacher. In doing so, he either agreed with the teacher(s) or differed from him/them.

Headmaster favoured the teacher(s) : The situations were generally of two types. Either the complaint was made by the child against the teacher or the teacher complained against the child. In most of the cases, the headmaster always made the teachers realize that by sending pupils to him for disciplinary action, they were abdicating a large part of their responsibility for the handling of such cases. However, in extreme cases, the headmaster actively worked with the teachers. On the other hand, when a child reported against a teacher, he was discouraged to adopt that type of practice and was never favoured by the headmaster except in very serious cases.

Headmaster disagreed with the teacher(s) : In one case, a teacher beat the child severely. The child reported the matter to the headmaster who had to give protection to the child. In another case, the headmaster received a proposal for the expulsion of a child from a teacher. In that case, too, the headmaster disagreed with the teacher and imposed some minor punishment.

It is true that the teacher's authority should not be undermined, but the headmaster should never 'upbraid a teacher in the presence of parents, or other teachers, or to take matters out of his hands obviously and pre-emptorily. The teacher who is having difficulty to his classroom needs assistance, not censure!' It is also right that teacher's constructive solution of disciplinary problems should be encouraged and only rarely should a disciplinary case should go to the headmaster.

But when a child goes to the headmaster to complain against a teacher, does it not mean, in most cases, an expression of failure on the part of the teacher? When a child weeps at the door of the headmaster's room, it indicates two things beyond doubt : the teacher is at fault and the child is still sincere. And if the headmaster does not favour the child, the child will begin to hate the school as a whole. Well, the headmaster should take some action in an appropriate manner. In an educational institution, all other skills are subservient to skill in handling people. It is obligatory on the part of headmasters and the teachers to be well-versed in the exercise of this important skill.

(iv) The Headmaster and the Community

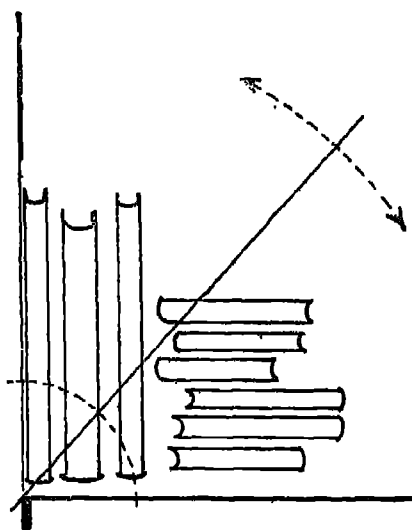
The child's problem is not only the problem of the teacher, the headmaster or the school, but is also a problem of the parents and the community. Its solution demands a combined influence of the school and the community. In view of this fact the modern headmaster's task is large and even growing larger. He is more than the head of an institution, he is a community leader

HOW HEADMASTERS SOLVE STUDENTS' PROBLEMS

and educator. The work he does in the school spills over into the community around him. The events and attitudes of the community come into the classroom with the students. To be a headmaster he must know both the school and the community and be willing to work in both to advance the cause of education.

In case of this study, only a few headmasters were sensible enough to realize this responsibility. And these sensible headmasters were awake only when the problems had become big. In some cases, they arranged talks by the teachers on 'Ill effects of indiscipline among students'. In other cases, the headmaster arranged a drama on 'Ill effects of misbehaviour by students'. The parents and the public were invited at all such occasions.

At such functions, some significant ideas were stressed : the problems arose when old people saw differently from the youth, elders usually forgot what they used to do when they were young, the young people demanded rights and privileges which the progress of present civilization guaranteed to all human beings, events which took place in the community significantly affected the school, school problems provided the parent with opportunities to work with the school, the school community organization could enrich both school and community, wide citizen participation in school affairs strengthened the school, school problems were the problems of the society, the community applied the same standard of conduct to itself as it expected from the school, and the like. □



Book Reviews

Becoming a Better Teacher : Microteaching Approach

Edited by B. K. Passi, Sahitya Mudranalaya, City Mill Compound, Kankaria Road,
Ahmedabad, January 1976, pp. 351, Price Rs. 60.00

A NUMBER of books have been written on subjects like teaching, training the teacher-educators, training the teachers for secondary schools and lower secondary schools, teaching as an art, teaching style, teaching techniques, and so on. But the present book *Becoming a Better Teacher : Microteaching Approach*, edited by Dr. B. K. Passi, is a unique one. This book is the outcome of a sustained research and development programme on microteaching carried out from 1972 to 1975 at the CASE, Faculty of Education and Psychology, M.S. University of Baroda. In fact, it has been a matter of greater criticism that the implementation of microteaching technique is almost impossible without the assistance of some useful equipments like Video Tape-Recorder (VTR) and Closed Circuit Television (CCTV) besides a few trained personnel to handle the equipments. No one can imagine the cost of such sophisticated equipments and some skilled personnel to perform

the tasks of microteaching. The procedure involves a lot of expenditure which does not seem to be feasible in a country like ours where economy is one of the crucial problems of the nation. The present book embraces this challenging task and fulfills the long-felt need of the teachers, teacher-educators and the researchers to a certain extent in a very economic way. The materials developed are more or less auto-instructional and all of them have been tried out at the CASE during 1972-75, without using CCTV or VTR. These materials, put in different 13 instructional skills, have been written by a team of spirited workers—B.K. Passi, M.S. Lalita, Bimla Passi and Sneha Joshi. These instructional skills are: writing instructional objectives, introducing a lesson, fluency in questioning, probing questioning, explaining, illustrating with examples, stimulus variation, silence and non-verbal cues, reinforcement, increasing pupil participation, using blackboard, achieving closure, and recognizing attending behaviour. These skills have been selected from a total of 21 instructional skills which are the components of the Baroda General Teaching Competence (BGTC) scale developed at the CASE in 1972-75. The BGTC scale has also been described in this book in detail. The above-mentioned 13 instructional skills have been classified under five major skills, namely, planning, presentation, closure, evaluation, and managerial. All the above skills, presented in the form of handbooks in this book, have been written in a very simple language with concrete examples from classroom situations. They provide the rationale, components, model lessons, and evaluation proformas for the concerned skills.

It has been heard very often that some people are born teacher; while it has been refuted and contended too strongly on the plea that teaching is an art which is learnt through training. But the present book, I am sure, can make a person wise in the art of teaching even without a formal training. The writers, in this book, have very precisely, and with appropriate examples explained each skill, for instance, how should the teacher enter the classroom, introduce the lesson, start teaching, perform the activities involving the students, stimulate better learning, avoid unusual activities like frowning and scolding, etc., use the blackboard, explain the lesson with proper examples, recapitulate the lesson, close the lesson, and assign home-works. Even a cursory reading of the book will be of great benefit to any reader. The language of the book is simple, logical and comprehensive. However, I feel that the book requires a little modification in the second edition. While presenting a model lesson, one must pay heed to the construction of the sentence besides the contents. I found this quality lacking at many places, for example, objective numbers five and six at page 75; similar deficiency can be observed at page 113 also. The sentences require restructuring. In another model lesson, at page 96, 'shoe-flower' is printed instead of 'sun-flower' which decimates the decency of the model.

lesson. Again, Mohan and Asha, in this model lesson for the 'skill of introducing a lesson', have been involved thrice in classroom participation. To maintain the homogeneity of the classroom participation, four more students could have been involved instead of asking the questions thrice to each Mohan and Asha. In Chapter 12 skill of using blackboard is explained very elaborately. Teachers usually fail to use the blackboard in the classroom teaching. I am sure the content of this chapter will make the teachers aware to use blackboard but the illustration, given at page 283, does not comply with the content portion. If the illustration could have been shown by a fair hand, the illustration part would have been in congruence with the content part of the chapter which could have been more effective.

The editor of this volume maintains that it meets the needs for a resource book and manual for the teachers and teacher-educators. I feel that these purposes are fulfilled. My concern is that some of the chapters may not look quite new for some persons, although many individuals may find an abundance of new ideas, concepts and illustrations. Although the book requires a revision, especially, as regards the construction of sentences and misprints are concerned; yet this is not a major deterrent.

To sum up, the editor has offered us a worthwhile and readable book which has brought together considerable theory and practice in a single volume. If I were to recommend in a single sentence about the book, I would say: Each and every teacher, teacher-educator, and pupil-teacher should go through the book at least once.

AMRIT NATH MISHRA

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The Politics of Manpower Planning—Graduate Unemployment and the Planning of Higher Education in India

Trilok N. Dhar, Minerva Associates Publications Private Limited, Calcutta,
1974, pp. xii+284, Price, Rs. 42.00 (cloth)

IMBALANCES between demand for and supply of manpower result in wastage or inefficient use of human capital for a variety of reasons: firstly, the

substitutability of human capital for physical capital is limited, and secondly, there is a time-lag in the process of producing human capital with special skills. So, manpower planning is very essential particularly to a developing economy like ours where human capital has to play a major role due to the insufficiency of physical capital. On the same grounds its application to education is justified. In his book *The Politics of Manpower Planning*, Dr. Dhar presents a conceptual framework of the manpower approach. This work is a modified and updated version of his doctoral dissertation, submitted to the University of California, Berkeley, in 1969, having been incorporated with the recent developments in both educational and political fields.

"Manpower approach to educational planning has lost much of its appeal", as the author himself admits. The reason lies with the socio-political and administrative constraints that come on the way of successful application of the technique to education. Dr. Dhar apart from dealing with the conceptual and operational limitations of the manpower approach to education (Chapter II), also pays much attention to the administrative constraints such as constraints on autonomy, bureaucratic deficiencies, constitutional and administrative arrangements, the frictions between the Central Government, State Governments, University Grants Commission and planning organizations, social circumstances, political environment, internal pressures like pressures on the appointment of faculty positions, distribution of scholarships, organizations of student welfare services, financial pressures, conflicts between teachers and students, and external forces such as from different social groups, politicians, caste associations, government demands and pressures—that pose serious problems in smooth running of the educational organizations. They are extensively dealt with in Chapters IV, VII and VIII, and the counter measures to be taken are suggested in Chapter IX, wherein he emphasizes the role of private sector and universities in manpower planning.

After explaining how to formulate educational plans and execute them, and also explaining the role of Planning Commission in the process of educational planning (Chapter V), the author makes a quick review of the policies and strategies that were proposed and adopted in the four five-year plans from 1951 to 1974 (Chapter VI). While evaluating the achievements, he finds several factors that tend to deflect the planning effort. After finding out how far the targets proposed are achieved in the last four plan-periods, the author rightly doubts the realization of the Fifth Plan proposals.

On the whole, the book is very interesting. It consists of nine chapters, the first one serving as the introductory chapter, and every chapter has useful bibliographical notes, apart from a more useful select bibliography at the end running into 30 pages. This book by Dr. Dhar, who has

done considerable amount of work in the field of education, deserves to be read by all those who are interested in socio-political and administrative aspects of educational planning.

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Bharatiya Bhasha—Shastriya Chintana

Edited by Vidyaniswas Mishra, Anil Vidyalkar and Maniklal Chaturvedi,
Rajasthan Hindi Granth Academy, Jaipur, Rajasthan, 1976, pp. 175, Rs. 9.00
(student's edition), Rs 11.00 (library edition)

THE DISCOVERY of Sanskrit by western scholars was one of the principal factors in the development of comparative philology in the nineteenth century, which has later on given rise to the modern linguistics. In fact there are many aspects of nineteenth century linguistics which are clearly derived from the practice and theory of the Indian grammarians, yet, it is surprising, that even after 25 years or so of their establishment, the departments of modern linguistics in a number of Indian universities have not been able to develop anything like 'Indian linguistics', in contrast with many schools of modern linguistics which have come up only during the last 30 or 40 years in Europe and North America. We will have only a glorious past and no future, if our university departments of linguistics go on imitating blindly the western linguistics, sometimes English, sometimes American and sometimes Russian.

Can we not have an Indian school of linguistics? Yes, certainly, but only when we understand our old tradition of grammatical analysis and apply our theories to our linguistic problems in the light of modern scientific knowledge. The present book *Bharatiya Bhasha—Shastriya Chintana*, i.e. Indian linguistic thinking, should, therefore, be welcomed, as it aims at bringing out collectively various ancient Indian theories regarding word, meaning and their relationship in 16 papers originally written in Hindi (except one, Prof. M.B. Emeneau's paper entitled 'India and Linguistics'),

and in examining the same critically in contrast with the modern theories of western linguistics.

The present book has in all 10 papers, dealing with the introduction to linguistic philosophy of Indian concept of *shabda* or word, *pratipadika* or nominal stem, word and meaning from the point of view of Indian grammarians, rhetoricians, logicians, Buddhist philosophers, etc. It also has a paper each on the concept of *vakrokti* (the structure of the poetic language), theory of Sphota, methods of Paninian linguistic analysis and the Indian concept of sentence and sentential meaning. Since all these papers are written by specialists of different branches of Indian philosophy, grammar and poetics, they are suggestive of many new areas of research and studies in the field of theoretical linguistics and hence should be of great interest to the students of linguistics not only in India but in other countries also.

Although most of the papers are well written, their printing is not up to the mark. There are many typographical mistakes in the book, and it, therefore, should be read with care.

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ANNOUNCEMENT

Research scholars in education are invited to contact the General Editor, *Indian Educational Review*, for getting the summaries of their Ph.D. theses published in the above journal. This is under the ICSSR grant to the NCERT.

Correspondence in this connection must contain the following information :

- (a) Topic of research
- (b) Year of submission and the name of the university
- (c) Whether already printed as a book or a research paper.

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Educational Research for Development

Models and Analytical Framework

M. S. GORE

DIRECTOR

TATA INSTITUTE OF SOCIAL SCIENCES

BOMBAY

THE THEME assigned to me for this talk—Educational Research for Development—is intriguing. It seems to subsume a relationship in which at least one step is missing. Educational research can only be concerned with education—its goals, its structure, its processes, the extent of its effectiveness in terms of its goals, the reasons for its effectiveness or ineffectiveness, the conditions under which it can be made more effective, etc. If educational research is to be oriented to development it can only be on the assumption that education is oriented to development. Is this the case?

The question cannot be answered unless we know the meaning of the term 'development' and the reason why education is expected to be related to development.

*Presented at the 'Educational Research Conference' organized by the Educational Research and Innovations Committee (NICER) on 1 and 2 November 1976

October 1977

The relationship between education and development is often derived from the following type of reasoning :

- 'Development' of a society involves the achievement of certain goals, material and non-material.
- This process of goal achievement is facilitated when the individuals who make up the society have imbibed valuesystem and behaviour patterns which are conducive to the particular processes of development.
- Individual values and behaviour patterns are shaped largely through the instrumentalities of socialization.
- Education is one important instrument of socialization in any society.

Two types of researchable problems can be formulated at this stage.

- Is Education an effective agent of socialization ?
- Is a particular system of education effective in generating a particular set of attitudes and capabilities which are considered necessary for development ?

At this stage, a further specification of the concept of development in its generic as well as particular aspects is necessary before meaningful guidelines can be derived for educational research.

(a) At the societal level, development has three or four aspects.

- (i) To begin with, development implies economic growth : this is usually calculated in terms of a rise in the gross national product but in developing countries it should begin minimally by removal of poverty.
- (ii) *Equality*—Usually this is interpreted to mean equality of opportunity and this is expected to be ensured through equality of access to education. Experience in most societies has shown that opportunity cannot be equalized except in so far social and economic inequalities are minimized, if not abolished.
- (iii) *Freedom*—Minimally, this should mean civil liberties and the right to vote, but freedom should also mean expanding opportunity for the citizen to participate in the decision-making structure at various levels of governmental and civic organization.

(b) A developing society is also a rapidly changing society. While the above three qualities characterize the social, political and economic framework of a developed society, there are also certain qualities that charac-

terize individuals who are members of a developed society. It is in fact these qualities of persons that have in some measure facilitated the development process in the developed societies. These personal qualities are :

- (i) *Creativity*—interpreted as innovativeness, ingenuity, resourcefulness and an ability to use available knowledge, information or skill in new ways.
- (ii) *Perseverance*—interpreted as a capacity for sustained hard work, atleast in some areas of interest.
- (iii) *Rationality*—interpreted as an ability to take decision and act on an objective assessment of facts.
- (iv) *Secularism*—interpreted minimally as freedom from religious prejudice in social relationships, but also freedom from superstition or unverified belief, and more generally, as a widening of the sphere of universalistic as against particularistic norms of social behaviour.
- (v) *Humanism*—interpreted as an attitude of measuring objects or actions in terms of their implications for the integrity of the human being.

Apart from these, the capitalist societies have emphasized much the quality of individualism. In so far as individualism implies autonomy of the individual psyche, the concept is valuable for socialist societies as well, but otherwise the socialist societies may require a subordination of individual interest to the group. Hence, for our society, we may emphasize :

- (vi) *Autonomy*—interpreted as mental and psychological self-reliance.
- (vii) *Group commitment*—interpreted as willingness to give national interests a priority over one's own self-interest.

Further, for all poor countries which are now in the process of development :

- (viii) *Austerity*—interpreted as a willingness to minimize personal needs, minimize social ostentation and eschew a general consumer orientation to life.

If the above are some of the characteristics of development at the societal individual level, it follows that the structure, content and process of education in our society must be such as to foster the development of these qualities. It is possible that there will be disagreement on

the characteristics of development listed above, but that will not basically alter the reasoning that whatever the characteristics listed finally the system of education should tend to support the generation of those characteristics in society.

(a) At the structural level one implication of accepting developmental goals is that education must expand, particularly at the school level, so that most of the young population is brought within its spheres of influence. However, given the limited resources available to the under-developed countries, education cannot expand unless it becomes less capital-intensive. What are the various ways in which the cost of education can be reduced and, also, the effective resources required for education be augmented? Is there a scope for mobilizing volunteers for reducing costs on buildings, on furniture, on the use of paper, etc.? Is there scope for greater utilization of plant, equipment and personnel resources currently available for each unit in the school system?

(b) In the content of education, the implication of accepting developmental goals is to ensure that the idea-content, the imagery and the suggestiveness of the textual content as well as the content of verbal communication is atleast not inconsistent with national goals and aspirations and generally supportive of them.

(c) For the process of education, the implication is that the pedagogic process, the methods of communication and teaching in the classroom, the method of organizing out-of-class activities, the total school experience of the child is such as to foster the personal qualities of autonomy, rationality, etc. A preoccupation with developing in the pupil a mastery of textual content is likely to hamper the development of these other qualities. The encouragement of curiosity, the element of discovery, the experience of reasoning from a set of facts to arrive at conclusions, a scope for spontaneous, unconditioned responses to the physical and social world around are important aspects of the learning experience which must be incorporated in the life of a child at school.

Once the implications of a developmental perspective for the educational system have been derived, the task of educational research becomes self-evident. Educational research—in so far as its developmental orientation is concerned—will address itself to four main themes:

- (a) What are the characteristics of the educational system at a given point of time?
- (b) Is education at a given time and a given stage achieving or serving the developmental objectives that have been set out for education?

(c) What are the factors that account for non-achievement of goals ?

(d) How best can education be made to serve these objectives ?

The descriptive, the evaluative and the diagnostic themes do not necessarily call for different methodologies to be adopted, though their objectives and analytical frameworks are different. The same initial tools of data collection may at times serve the three different objectives. The descriptive study answers the question—What is ? The evaluative study answers the question—What might be wrong or what might account for inadequacy ? Because of the different questions they seek to answer their analytical designs are likely to be different, but they all have to start by answering the first question—What is ?

The question—What is ?—seeks data about an existing situation either at one point of time or at different points of time. In the first instance one gets a cross-sectional view of the object studied in terms of as many attributes as one chooses, in the second one gets a measure of change of both in quantitative and qualitative terms about the attributes that one had decided upon to begin with.

The data about an extent phenomenon or situation with regard to education can be collected through any of the following known methods :

(a) Routine information gathering through administrative and institutional channels. For example :

(i) Data provided by the national census on sizes of population of particular age-group or age-sex-group, or cast-group and the levels of education attained by them—by district, state and for the country as a whole.

(ii) Data collected through education departments of states and collected at national levels—about institutions, beneficiaries, dropouts, teachers, qualifications of teachers, salary-scales, etc.

(b) Data collected through studies of samples drawn from a defined universe consisting of schools, or teachers, or students, etc. Such direct studies of samples—sample surveys—can provide varied data :

(i) Additional data on demographic variables such as age, sex, caste, religion, etc.

(ii) Data on socio-economic attributes of the sample studied.

(iii) Data on attitudes, opinions or belief systems generally.

The data collected through administrative channels and/or through sample surveys can help to build up a picture of the extent of coverage attained by the education system, the variations at different levels, the

over or under-representation of particular categories of the population in the student body, the qualifications of staff, the size of class, subjective responses of the students and teachers to various situations, the extent of dropouts or wastage in the system, etc.

(c) Data collected through analysis of content of textbooks, lectures and other forms of communication materials. Content analysis can be used to study directly communicated messages or messages communicated indirectly through the use of cultural stereotypes as reflected in the casting of characters and attribution of differential qualities to particular ethnic groups.

The data gathered through content analysis will give a measure of the kind of messages transmitted directly and indirectly and their implications for reinforcing or removing various types of prejudices. These kind of data, taken together with the data on attitudes, opinions, etc. are useful in the study of problems of prejudice, alienation and social integration. Unlike surveys, which normally give us data on the consciously held and shared opinions, content analysis can be a tool for obtaining an insight into covertly held and communicated attitudes. Since textbooks are the most important single tool used by the teacher in the education process, analysis of textbooks would be of help in examining what the 'bias' of the message is; how far it is in conformity with overall policy, what kinds of reactions it arouses among students and whether this entire process is statistically associated with the development of desirable personal and social attributes among students.

(d) Finally, intensive case-studies of individuals and institutions can make available data on subjective responses of individuals to various life situations, on the nature of the internal dynamics of personality, on the types of role-interactions in an institution, the responses of particular roles occupants—say students or teachers—to particular educational or institutional policies, the operational characteristics of particular programmes and activities, etc.

The data collected through adoption of these various methods—the census, the sample surveys, content analysis and case-study—can be used for answering questions about the existential characteristics of particular system, i.e. descriptively, but they can also be used for evaluative purposes.

Evaluation involves two steps: (i) the development of indicators which would measure the attainment of desired qualitative and quantitative goals, and (ii) the examination of data about a system collected at any point of time in terms of these indicators. Thus we can evaluate survey data on enrolment in terms of the extent to which, say, the

goal of equal opportunity to all has been attained. The development of indicators is a crucial step in all research that goes beyond the stage of description. In fact, even in descriptive research often statements of the simplest variety involve the use of indicators, since all descriptions are in terms of concepts and indicators are descriptive concepts. Hence, one step is removed.

If descriptive research tells us the attributes of a situation under observation, and evaluative research tells us whether the observed attributes conform to the desired end-state or how far they so conform, diagnostic research should tell us what may account for the existing situations. The logical sequence involved in diagnostic research models is as follows :

- (a) This is what the existing situation is, as described in terms of certain concepts.
- (b) This situation does or does not conform to the desired end-state in terms of certain agreed indicators.
- (c) The probable factors which *account for* the existing situation being what it is (or, other situational attributes *associated with* the prevalence of the existing situation).

The surveys and content-analysis methods of data collection are not ideally suited to serve diagnostic purposes. The case-study method, which gives additional subjective data and insights of what according to the subject-respondents might be the important factors 'accounting' for a given situation is somewhat better suited, but basically any diagnosis which is based upon a cross-sectional view of what the current situation is only in the nature of an *ex post facto* statement of probable inter-relationships based on statistically observed associations between two sets of attributes, one set of which is regarded as having been 'responsible' for the other set. The imputation of causality is at best tentative and conjectural. The analytical design consists of first undertaking cross-tabulations and progressively holding different factors constant in higher order tabulations. Alternatively, the analytical design may seek to establish varying degrees of association of the 'dependent variable' with a multiplicity of 'independent' variable through the use of factorial analysis.

The fact that most 'causal' imputations in cross-sectional one-time studies are conjectural has made researchers look for a more satisfactory model of study and analysis. In physical sciences—and to a lesser degree in the biological sciences—the accepted method of establishing definite 'causal' relationships is the method of laboratory experimentation under

controlled conditions. In scientific logic where *A* is said to be the 'cause' of *B* it implies that :

- (i) *A* is a necessary condition for the occurrence of *B*
- (ii) *A* is a sufficient condition for the occurrence of *B*, and
- (iii) *A* precedes *B* in time-sequence.

In social sciences causality in this sense is rarely, if ever, fully established.

The attempts have, however, been made to create laboratory experimental situations for the study of social phenomena. In the field of education and particularly educational psychology, these methods have been adopted much more commonly than in other spheres. There are several practical and theoretical problems involved in the wider use of the experimental method in social sciences. Some of these are :

- (i) The impossibility of creating a real-life social situation involving complex systems in the laboratory. The experimental situation has necessarily to be limited to a limited number of subjects, a limited number of experimental variables, a limited number of stimuli and a limited number of subject reactions.
- (ii) The difficulty of discriminatively separating the subject's response to the objective situation and to the situation as he subjectively perceives—with all its rewards and threats for his ego system.
- (iii) The difficulty of controlling experimental variables.
- (iv) The problems of the ethics of experimentation with human subjects.
- (v) The problem of specifying a point of time where the effect of the experimental variable may be said to be over or complete since, in many cases, the subject's reaction to the experimental situation may go on in his own mind much beyond the point at which the response has been measured.

Despite these important problems the laboratory experimental method and the survey using an experimental design have both been used effectively in social research. The small classroom situation often lends itself more easily to the use of the laboratory experimental method, where students' responses to particular forms and content of messages can be studied and where genuine before-and-after measures can be taken.

To the extent that the experimental method can be adopted at all, it enables the educational researcher to go beyond the conjectural phase, both in the area of a diagnosis of what may have gone wrong as

well as a prescription for what should be done to overcome present limitations or failures.

The experimental and research-cum-action studies, both of which involve modification of experimental stimuli, seek to answer such questions as: which texts, which pedagogic tools, which teacher's personality or mode of handling is likely to achieve particular goals atleast in the experimental situation? They can generate new ideas which would then have to be tried out in new situations

If description, evaluation, diagnosis and prescription are the four orientations of scientific activity, it is suggested that census studies, surveys, case-studies provide various methods and analytical designs to serve these several orientations. However, questions of educational policy are often so global, the populations they cover so large and complex; and the nature of processes so long-ranging in their implications that most research designs with short spans of time cannot adequately answer the questions of policy-makers. In areas of major educational policies and their impact on society, often the historical-comparative method may be more suggestive of appropriate policy and action in particular situations.

The logic of the historical-comparative method is not essentially different from the logic of most other methods. The effort is to find out through comparison of historical situation in different societies the 'associations' between two or more social phenomena under observation. Thus, one studies the different policies in education adopted by two or more countries at the beginning of their period of industrialization and then relates these policies to the observed consequences in the spread of education, in the pace of technological advancement, etc. and derives certain tentative hypotheses from them. As the data for more and more societies on the many situational variables become available, the hypotheses about the relationships between the 'causal' phenomenon and the social consequence can be refined. This is the method adopted by philosophers of history, by political theorists and by social scientists. Marx and Weber have both used this method in their writing. Macro-level analysis is difficult without the use of some hypotheses derived from systematic or impressionistic reviews of historical experience. The more conscious and the more rigorous the exercise is the more effectively will it serve the purpose of deriving policy guidance from a study of historical phenomena.

The difficulties in the adoption of the historical-comparative method derive largely from the fact that no two societies are alike except at certain levels of analytical abstraction and one makes several assumptions in developing and working with abstract analytical concepts. Many of these assumptions cannot be verified in respect of historical societies ☐

Universalization of Elementary Education

Some Suggested Areas of Research

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SOME theoretical and practical issues regarding socio-economic deprivation, wastage in education and the problem of universalization of education have been discussed elsewhere.¹ The following broad areas of research, along with some topical details are suggested in the context of conceptual models presented in the above paper. The specific topics are only suggested as illustrations. Some other similar topics may also be considered in the given area of research. Each problem will require a detailed research design and strategy. However, all the suggested areas and topics of research aim at creating knowledge and practices of effective intervention for dealing with the problems of wastage in education and

* Paper presented at the Educational Research Conference organized by the ERIC (NCERT) on 1 and 2 November 1976.

¹ Prayag Mehta, Socio-psychological interventions for universalising education: A case for radical social transformation and non-formal education, New Delhi: National Labour Institute, 1976 (Mimeo.)

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for accelerating the tempo of universalization of elementary education and of adult literacy.

Social Transformation of Marginal People through Non-formal Education

This project should be launched in some selected areas for the education of rural labour, bonded labour and such other weaker sections of the rural society. To begin with, the project may include adults in the age-group 15-25 and children in the age-group 6-14 years with provisions for some work with children below 6 years and some other categories of people above 25 years of age. The project should help people develop various skills for organizing themselves to take active part in the various developmental activities. They should be involved in thinking and planning such activities, and in making attempts for procuring credit and other material facilities needed for launching some viable economic projects in their respective areas. Such people should be further involved in planning and carrying out non-formal education for children in the age-group 6-14 years. Some specific subjects of research under this area are as follows :

- (a) Organizing education camps for rural labour ; developing consciousness, a desire for assertion and a sense of social efficacy among them. Such camps will also be organized specifically for women.
- (b) Development of a desire and skills for self-employment. Attempts at developing entrepreneurial behaviour and skills. This can again be organized for both men and women.
- (c) Developing participation of the concerned people in thinking about projects of self-employment and their implementation. Functional and social literacy will be developed around these projects.
- (d) Working with development administrators and support systems such as rural banks for reorienting their attitudes and images and development of skills for supporting the on-going activities, and initiating new projects.
- (e) Mobilization of local resources and other external economic inputs for launching small projects. Literacy programmes will centre round such inputs. Involving children in the age-group 6-14 in suitable ways in various activities of the project. A non-formal education strategy to be developed for integrating the psychological needs of such children and the requirements of the socio-

economic development programmes visualized in the project.

- (f) Developing interface between parents and children using one for the education of other and *vice versa*.
- (g) Development of suitable training and educational materials, including some broad themes for a curriculum for such a project.

*Research Designed to Improve the Efficiency
of Formal School System and Institution Building*

Such a project can be launched in one selected district with the main objective of improving the general efficiency of the school system. This should aim not only at elimination of wastage but also at continuous motivation of human agencies and improvement in the quality of education. Teachers, pupils and administrators in such emerging school complex should also be used for non-formal education of the community. Some specific projects suggested in this area are :

- (a) Development of morale and motivation of the human agencies.
- (b) Restructuring of administration and management of the system.
- (c) Utilization of local and community resources for reinforcing the work of the school.
- (d) Developing school-community interface.
- (e) Developing suitable intervention strategies where teachers, pupils and other school administrators can be used for launching non-formal education of the community.
- (f) Increasing participation of the concerned people, including teachers and pupils and parents in reforming and formulating formal school curriculum.
- (g) Using the emerging experience in such a project for training of teachers and for development of suitable cadres which will eventually become facilitators of non-formal education.

*Collection of Themes and Other Materials for Development of Socially
and Cognitively Relevant Curriculum in Elementary Schools*

In order to provide elementary education to young children in the age-group 6-11 on the principle of "new and should not be so new" and on the principle of overlap in the field of experience of the children and that of the experience implied in the textbooks as taught by the elementary school teachers or continuous search of relevant themes is needed.

Such a socially relevant and cognitively acceptable curriculum may also be found useful for non-formal education programmes for the

concerned people. All such materials should be tried out and tested in formal and non-formal education situations. A new approach of curriculum development and teaching may follow.

One of the main difficulties which the culturally deprived children have to face is the bias in curriculum and textbooks. The following researches are suggested for remedying such a situation :

- (a) Collection of themes concerning the life and culture of the local community.
- (b) Search of folklore, folk stories and such other traditional materials with a view to identifying relevant themes. The effort here should be to develop materials which may reflect the field of experience of the local community and their children.
- (c) Talented persons at the local level be identified to work as facilitators and consultants in such a collection of themes. The same persons can be trained to work as part-time teachers for the younger children.
- (d) Some experiment for developing educationally sound pre-school experience for the deprived children. Use of traditional and mass media for this purpose. Involvement and education of mothers will be an important part of this project.
- (e) The inventory of themes to be used for developing a thematic dialogue and education of the concerned illiterate adults. Such an attempt will seek to integrate the adults for non-formal education of parents and their children.

Entrepreneurial Development of Rural Labour and Marginal Farmers

As a part of the socio-economic development of the poor people, various kinds of products are being introduced to create employment and self-employment for them. The conversion of an agricultural labour or a small farmer into an artisan or a small entrepreneur is indeed a qualitative development in the psychology of the concerned people. It will be worthwhile, therefore, to take up a project for developing entrepreneurial behaviour among such target groups. The following studies are suggested :

- (a) Procedures for identification and selection of potential entrepreneurs.
- (b) Training of such entrepreneurs.
- (c) Development of suitable materials for training.

- (d) Development of a support system in order to reinforce the successful implementation of small entrepreneurial activities in villages. The agro-industries development corporations, the emerging rural banks and other credit-giving agencies should be invited to collaborate with educational agencies for launching such a project.

Workers' Participatory Education and Involving Workers in their Children's Education

A comprehensive project for promoting skills of participation among workers and for promoting actual participation in industry and management. This will be an attempt to use the industry as well as workers' education agencies, including polyvalent institutes for promoting education among children and their parents. This will be particularly relevant for industrial slums in large metropolitan cities like Bombay and Calcutta. The project should aim at developing socially conscious and active cadres for working as facilitators of spreading education among other people, particularly the eligible children. Thematic approach should be tried for promoting education for social consciousness and participation.

Some specific projects in this area are suggested below :

- (a) Use of industry as a school for workers, promoting skills of participation and actual participation with a view to develop consciousness and efficacy among them.
- (b) Non-formal education of workers in general. It should include programmes of literacy as well as programmes of skill development.
- (c) Involving workers in non-formal education of their eligible children.
- (d) Development of suitable themes and curriculum for education of parents and children.
- (e) Education and development of socially conscious and active cadres to work as facilitators of non-formal education among parents and children. A thematic approach to such education. □

Priorities for Research in Education

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CONTEXT FOR THE DEFINITION OF PRIORITIES

THE issue of priorities for research in education can be considered from several vantage points. It is important to specify the vantage point from which priorities for research have been identified in this paper, viz. the terms of reference for one of the task forces set up by the Educational Research and Innovations Committee (ERIC) of NCERT to advise the Council on research priorities. This task force was specifically required to spell out research themes that would contribute to solving the problem: How education can be made more relevant to the socio-economic needs of the country.

Paragraphs 4.3 and 4.4 of the document *NCERT Research Schemes—1975*, provide specific guidelines in terms of which the themes for research aimed at making education “more relevant to the socio-economic needs of the country” may be defined. Since the research priorities set out in this paper have been identified with reference to these guidelines, it may be pertinent

* Paper presented at the Educational Research Conference organized by the Educational Research and Innovations Committee (NCERT) on 1 and 2 November 1976

to quote these paragraphs by way of an introduction to the statement of research themes that follows :

4.3 How education can be made more relevant to the socio-economic needs of the country is another important area of research. Research investigations and innovative projects in this area will be encouraged to find out how the existing educational structure and content can be altered, enhanced and modified to bring about faster economic growth and social change. In this connection research programmes on problems like life-long recurrent education and self-reliance, education and social mobility, strategies of human resource development, area studies of growth and development-oriented educational structures, optimum allocation of resources within education and between education and the rest of the economy, studies in educational finance, administration and planning, including management of systems and cost effectiveness, will receive support.

4.4 The above examples are illustrative of the important problems which require immediate attention but which have possibilities of contributing to the knowledge and understanding of educational processes, human development and many other things which contribute to the educational development of a society. The problems of the classroom, the teacher and the students, educational administration and supervision, child development and processes of learning, changing culture and values, etc. which are no less important in improving the quality of instruction will also receive support, but the quantum of assistance will depend on the relative weightage given in terms of the priorities mentioned above.

The research implication of the objectives defined above are as follows :

1. *Identification and specification of the socio-economic needs of the country, particularly in terms of the qualities, skills and attitudes to be developed through education.* For instance, egalitarianism, secularism, nationalism, and integration are some of the qualities that may be considered to be 'needed' by Indian society. Thrift, productivity and capacity to innovate, to identify resources, to utilize them to their optimum capacity without wastage, are some of the qualities that need to be developed in order to fulfil the needs towards economic development. Other socio-economic needs require to be identified. Further, all these needs have to be spelt out both in terms of structural changes called for in Indian society, as well as in terms of changes in terms of the qualities, attitudes, values and capacities required to be cultivated among Indians as individuals.

2. *Working out the operational implications of gearing education to socio-economic needs, and to the ideal of equality.* For instance, it is necessary to examine ways and means of promoting secularism and nationalism through the process of socialization at school and college. Similarly, it is necessary to examine existing practices and procedures, for instance, practices pertaining to the financing of education or the existing permissiveness regarding variations in standards of equipment for schools and colleges and to spell out the kind of policy reforms and innovations which are to ensure that education is geared to the socio-economic needs of the nation.

3. *Making systematic analyses of the existing systems of education with a view to (a) understanding its structure and working with reference to requirements as spelt out above, and (b) identifying the lacunae, gaps, and shortcomings in the systems in terms of its capacity to contribute meaningfully to the socio-economic needs of the country.*

4. *Conception of programmes directed towards (a) the operationalization of goals as visualized with reference to 1 and 2 above, and (b) towards the bridging of the gaps between the existing system and the goals visualized.* The development of model schemes and programmes, designed for specific regions in consideration of the specific local socio-economic needs and potentialities of these regions.

5. *The launching of action research and evaluation programmes.* While each of the above-mentioned implications define five distinct tasks in terms of which research areas and themes may be defined, the themes themselves may not fall neatly under one or another of the points specified. Rather, they are likely to cut across two or more these basic concerns. The following are nine areas, together with specific themes under each area, that deserve priority from the vantage point of the concerns specified above.

DEFINITION OF PRIORITIES

1. *Conceptual Analysis of the Socio-economic Needs of the Country.*

The preparation of a series of thematic papers defining the socio-economic needs of the country, both at the national and the state level and at the level of the administratively viable units, such as the districts within each state. To be truly useful, such papers must be based on statistics, research studies and other data regarding the socio-economic situation in the country. Plan documents, statements on socio-economic policy, and other documents reflecting thinking on development for India must systematically be drawn upon for the preparation of these papers.

2 *Analysis of the Education System as it Functions Today: Its Relevance to Economic Development and to Social Change*

A. ANALYSES OF THE CONTENT AND THE PROCESS OF LEARNING

At different levels of school (primary, secondary) and the different level of higher education (graduate, postgraduate, doctoral, etc.)

To indicate whether or not, and if so how, the content and process of education contribute to factors such as :

(a) *At the personal level—*

1. Self-reliance.
2. Individuation.
3. Capacity to earn a livelihood/contribute to the economy.
4. Ability to identify and to solve problems relating to real-life situation/skills/professional expertise, etc. for the purpose.
5. The productivity of a worker of efficiency and adjustment at work.
6. Awareness of the social situation, a sense of civic and social purpose.
7. Political awareness and a sense of political responsibility.
8. Other qualities relevant to socio-economic development.

(b) *At the societal level—*

1. Integration.
 2. Secularism.
 3. Democracy.
 4. Economic development in terms of increased productivity.
 5. Modernization and change in the direction of development in such terms as the concept may be defined in exercises conducted under (1) above.
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B. AN IDENTIFICATION OF THE SHORTCOMINGS, IMBALANCES AND INEQUALITIES IN THE PRESENT SYSTEM OF EDUCATION

(i) A probe into and the identification of factors responsible for non-fulfilment of educational targets.

(ii) Correspondingly, the detection of over-shooting of targets—an identification of the factors responsible for this, and an analysis of the implications of this, e.g. in terms of the unemployment of graduates, the migration of the educated elite, and their absorption in the world market, etc.

(iii) The identification and description of *imbalances* in the growth of education (in the provision of facilities and expenditure, enrolment, etc.). Imbalances could be in the form of : levels achieved/provided for; in the variety of courses made available; physical plant and personal facilities provided, etc. There could be imbalances both in the quantity and quality of facilities provided which are likely to appear as inter-regional or inter-state imbalances at the national level, inter-district differences at the state-

level, also, as imbalances between the sexes, between different religious groups, between castes (particularly the 'backward' castes and the 'higher' castes), or between rural and urban areas both at the national and the state level. It would be useful enough to identify these imbalances, probe into the factors responsible for these imbalances, and to suggest measures for their elimination.

3. *The Management and Administration of Education : The Formal System*

(i) Analyses of the structure and the organization of the education system of the country, with a view to examining whether the structure is suited to the objective. Is there too much centralization and too little autonomy? Are there satisfactory linkages between the various levels of education, viz. primary, middle, secondary and district level planning, organization and administration of education? Are structures of the different stages disparate? Is the system as a whole well-integrated?

(ii) The school, the college and the university as systems. Organization studies oriented towards developing insights for the more effective management and administration of these organizations.

(iii) What are the different types of managements that manage schools and institutions of higher education today? An analysis of each type of management (government, private, missionary, etc.) with a view to examining their goals, objectives and operation, and their effectiveness and efficiency in the achievement of goals relevant to the socio-economic needs of the country.

With reference to the above-mentioned areas, there should be a special focus on :

- (a) Minority institutions—An analysis of minority rights in education, and of the implications and consequences of these rights.
- (b) Government institutions—An analysis of how their management, organization and administration is different from others.
- (c) Comparison between rural and urban institutions.
- (d) Elite and non-elite institutions—With a view to understanding differences in terms of facilities they provide, skills and qualities they develop, behavioural norms they encourage, political attitudes they promote, economic aspirations they cultivate, and the culture they breed.

(iv) How is the policy on education formulated? To what extent are

teachers, administrators and managers of education aware of policy and its implications ? How does awareness or non-awareness of policy on the part of these persons affect the effectiveness of education. An analysis of some of the recent policies on education, their implications and their consequences.

There should be special focus on the following :

- (a) The 10+2+3 system of education.
- (b) New university acts, codes of conduct for teachers, etc.
- (c) Impact of the curricular load in the hours and the amount of information contained in the educability of (i) talented, (ii) ordinary, and (iii) backward children.
- (v) Relationship between directed use of leisure, and (a) academic performance, and (b) creativity.
- (vi) The optimum starting age and the period of exposure for the primary school children.

4. *The Financing of Education*

(i) What are the patterns of the financing of education in the country ? What are the relative shares of the public and the private expenditure on education ? What are the sources from which the funds for both kinds of expenditure are drawn ?

(ii) What kind of rights do the financiers of education, both public and private, exercise on educational policy—on the management, organization and administration of education ?

(iii) What are the ways and means of optimizing resources available for education ? What kind of economics is it possible to affect ? Are there any alternative sources from which resources for education may be drawn ? It should be possible to organize a whole range of studies around this issue. The studies should aim at

- (a) analyzing current patterns of financing for and budgeting in education, with a view to identifying wastages and suggesting economics;
- (b) developing techniques and models for analyzing costs in education, and for the preparation of blueprints and budgets based on unit-costs ;
- (c) developing models and action studies, both in the rural context and urban context for literacy, and primary school education programmes that operate at low cost but which nevertheless fulfil the basic objectives of education.

5. Education and Social Mobility

(i) An analysis of how far education makes for occupational and social mobility : Is education an equalizing agent at all ? Is it a major determinant of social status ? If only a minor variable, what are the major determinants of status and mobility in Indian society ?

(ii) An analysis of the economic, political, professional, and administrative elite, with a view to understanding the extent to which education has contributed to their status.

(iii) Identification of factors that make for good performance on the part of students who excel, and poor performance of students who do not do well. Studies on social class and other background factors and performance in education.

(iv) How is excellence of performance in education defined ? To what extent is excellence in performance as defined in education related to success in terms of personal achievement ? To what extent is it related to the utility of individual to society ? How is backwardness in education defined ? What are the disadvantages of educational backwardness to the individual and to society ?

(v) Analyses of learning problems of under-privileged students.

6. Innovations in Formal Education

(i) Research into new modes of organizing education, administering educational institutions, teaching, evaluation, etc. with a view to developing techniques and strategies for

(a) handling the problem of mass education;

(b) obtaining within the education system the dynamism which is required to ensure that education is relevant to the needs of the country.

(ii) Adoption of experimental projects relevant to the surrounding milieu of the school.

(iii) Research into improvement of the teacher and his teaching methods.

(a) Action research into teachers' use of new material.

(b) Action research in motivating the teacher to interact with the surrounding community.

(c) Use of non-professional teachers as substitutes for professionals.

(iv) Experiments in partially deformatizing the formal system through introduction of flexibility of schedules and emphasis on creativity and innovativeness.

(v) Action research along with documentation for assessing and eliminating the growth of parochialism and other evils that could sometimes be spread through adopted curriculum.

(vi) Experiments in building the community and teachers' leadership in planning syllabi including co-curricular activities linking the school to its environments.

(vii) Institution-building research with particular reference to the development of community and teachers' leadership and development of general ethos in a school system to bring education closer to nation-building activities.

7. Non-Formal Education, Particularly Education for the Deprived

(i) Conceptual analyses of what exactly is meant by non-formal education : What are its advantages vis-a-vis formal education ? Are the costs of non-formal education less than the cost of formal education ?

(ii) A descriptive analysis of some of the on-going experiments in non-formal education in the country, particularly with a view to examining their replicability and extendability. These analyses should focus on :

- (a) Documented studies of successful schemes which were not or could not be replicated, with a view to identifying problems of replication experimental projects.
- (b) Specifying the social costs and benefits of a selected scheme of non-formal education.
- (c) Investigation into the acceptability of selected programmes to employers or other bodies likely to cooperate in schemes for non-formal education.

8. Innovations in Non-Formal Education

(i) Development of curricula based on educationally valid and socially relevant themes for non-formal education, experimental implementation of these curricula and evaluation of the outcome.

(ii) Experimentation in the training of local-level leaders and other human resources for launching interventions to fight against backwardness and inequality in education—evaluation of the outcome.

PRIORITIES FOR RESEARCH IN EDUCATION

(iii) Absorption of input from the formal school system for non-formal education, viz.

- (a) Use of professional teachers for non-formal education.
- (b) Adoption of teaching aids available in a school for non-formal education in its surrounding area.
- (c) Participation of National Social Service volunteers and of school children as young teachers in the community—evaluation of the outcome.

9. *Specific Issues*

- (i) Tensions in educational institutions
- (ii) Apathy in educational institutions, particularly the colleges of education
- (iii) Disaffection among teachers
- (iv) Student unrest/apathy.
- (v) Corruption in education, etc.
- (vi) Problems in the implementation of innovations and reforms. ☐

Educational Research in India

Determinants and Directions

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INTRODUCTION

EDUCATIONAL research in India is both a challenge and hope. Though the environmental situation in India has undergone a change, education has not shown a corresponding rate of growth. The first task of educational research, therefore, is to help education grow faster to catch up with the progress in social, economic, political, industrial, technological and scientific fields.

In our ventures of educational research we ought also accept that it is difficult for educational innovations alone to change the social order. We should, therefore, restrain our ambitions in this field and pitch our targets to realistic levels.

* Paper presented at the Educational Research Conference organized by the ERIC (NCERT) on 1 and 2 November 1976

EDUCATIONAL RESEARCH IN INDIA

AIMS OF EDUCATIONAL RESEARCH

Though several aims of educational research could be identified and stated, three of them stand out as the most prominent ones from the functional point of view in the present context :

- (a) Educational research should influence policy-making at the governmental level.
- (b) Educational research should potentially help the teacher in improving instructional procedures and practices.
- (c) Educational research should help in the improvement of the level of achievement of individuals and the standard of education in general.

CONSTRAINTS IN EDUCATIONAL RESEARCH

Educational research is not free from constraints that limit its scope and even the pace of its progress. A few of these are :

- (a) The common debate between basic and operational research on which even the policy-makers have often shown frequent shifts.
- (b) The natural resistance to change in the field of education as it is in other fields, where the results of research are not able to find application even when they may be acceptable on the academic plane.
- (c) The low position of education among national priorities is a chronic malady. This emaciates educational budgets and even there the demands of quantitative expansion leave little for qualitative work where research is the worst hit.

IMPEDIMENTS TO EDUCATIONAL RESEARCH

(a) The ad hoc nature of educational research, which is a natural outcome of the lack of consensus regarding a national policy on education, is also responsible for most of the wastage in this area. This is also responsible for the innumerable dissipated ventures of educational research.

(b) Lack of coordination of research in education is an outcome not only of the absence of national educational policy but also of the absence of any machinery or strategy for coordinating research at the national

level. Unnecessary duplication of research is the natural result of this phenomenon.

(c) Superficial nature of the problems of educational research pursued at different places is another problem caused by the lack of feedback from the field and classical divorce between the theorist and the practitioner.

(d) Administrative bottlenecks are the common phenomenon in education as they are elsewhere. The rules and regulations and the rigid interpretation of the same from an unacademic angle is one of the greatest hurdles in the effective pursuit of educational research. To quote just one example, it can be mentioned that even when funds are available their timely release is difficult.

(e) The unacademic approach to educational research is another very great problem. It is expected that the research will follow a predetermined course, and that its results will only strengthen the accepted beliefs of the administrators and anything going contrary is often not accepted or encouraged.

(f) The expectation of quick results from educational research is another thing that divides the administrators and the researchers. In educational research some gestation period has to be permitted. There are a lot of concomitant things which also need to be taken care of while considering the implementation of a single result of research. Apart from this, some wastage will have to be accepted in educational research. If that were not so, it would not remain research.

OPERATION OF EDUCATIONAL RESEARCH

Educational research in India is mainly initiated by :

1. students for getting degrees ;
2. some individuals and agencies voluntarily ;
3. agencies, institutions and individuals for seeking the solution of the problems they face ;
4. professional individuals, agencies and institutions commissioned to do research.

The students, by and large, conduct research which brings out some academically interesting results. The basic interest is mainly academic and often it also remains at that level except in exceptional cases.

Educational research is also conducted by some private or governmental agencies. The horizons of such research are often not wide enough because

of the lack of interaction with other disciplines and people outside the organizations. This aspect, again, is something that deserves the active attention of the people concerned.

The commissioned research is mainly functional though in some cases the research financiers do support basic research as well. This kind of research is often limited to the more immediate problems and the wider perspective required is often missing.

CRITERIA FOR EDUCATIONAL RESEARCH

Criteria for educational research from the theoretical point of view are not different from the other areas. But if looked at from the practical angle the following criteria specific to educational research emerge.

(a) Relevance is the most important criteria. It is no use conducting research on areas which are not even remotely connected with our educational structure, strategies, problems, etc. The problems of research have basically to be relevant to our needs and situations. Both the social and the scientific relevance has to be considered in this regard.

(b) Educational research ought to be creative and not just stereotyped. It is often seen that replication of studies done elsewhere is frequently attempted because comparative data is a variable. Though replication in certain cases ought to be encouraged, its routine attempts deserve to be checked. There are so many problems today that it is impossible to contain them in any list and the researchers should identify the ones which are comparatively new and challenging and, above all, capable of giving returns.

(c) Educational research ought to be undertaken not only to study the changes but to change education. In the ultimate analysis education should be conceived as a medium of change and national reconstruction and research should form the foundation of such endeavours.

(d) Such problems really deserve to be investigated as may help make education a self-renewing and a self-generating process. In view of this, it is necessary to think of educational research as something built in the educational procedures and practices.

(e) Educational research ought to encourage an interaction with experts in fields which are basically educational. This is one of the shortcomings in our educational research. Attempts at such interactions in the course of research and the participation of the so-called non-educationists will indeed make education more worthwhile than what it is today. For instance, though the problems of unemployment and under-employment

are the predominant ones, there is also the problem of the unemployability of the educated because education is not able to prepare them adequately for life. Such problems can be tackled through interdisciplinary interaction.

(f) Educational research should ultimately come nearer the schools and colleges. The findings of research should be of immediate relevance to the problems of formal and non-formal education. They should indeed strengthen education and enable it to fulfil its obligations.

CONDITIONS FOR THE SUCCESS OF EDUCATIONAL RESEARCH

Experience shows that there are certain factors, which hinder the effective pursuit of educational research. It is, therefore, necessary to consider them and identify those which prove to be constructively helpful in educational research. Some of the major conditions which are conducive to good research are given below.

(a) Making the teacher a participant in educational research rather than merely the consumer of the results of research. This would make research realistic and ensure the practical feasibility of the use of its results.

(b) The research worker ought to be granted the freedom to modify his approach, to add some new hypotheses to be tested, which he considers as relevant, and to affect necessary changes in the methodology and tools.

(c) The researcher should not hesitate in tapping informal methods and mechanism. This has particular relevance to the situations obtaining in the State Departments of Education where speed of work cannot often be accelerated because of their multifarious activities. It may, therefore, not be in the interest of expeditious research to entrust the collection of data to such agencies. Instead, some informal methods ought to be identified and used.

(d) Coordinating educational research in such a big country as ours is a big problem, but some way has to be found to make it possible. For this, the starting point could be the national policy on education and the statement of national goals. All educational activities including research will then be directed to the achievement of these goals. Even with this, it will not be possible to bring about the desired coordination for which central and state ministries of education and their corresponding agencies like UGC, NCERT and SCERT/SIE should come together to decide on national and state priorities. This will also help eliminate the normal duplication and dissipation of effort.

(e) Research worker and agencies often have a tendency to start from a scratch to have their own data in which naturally they could have greater faith. But such a process is usually costly and time-consuming. We should rather try to utilize the data and results of research available in the country and proceed from a forward point rather than a backward one.

THE FUTURE OF EDUCATIONAL RESEARCH

It is not desired here to give any areas of research but to suggest a *modus operandi* which may be able to give our endeavours of educational research a comparatively smooth road to travel. They could even be interpreted as the steps we may take in the direction of educational research.

(a) Constant and rigorous attention to the national policy on education and the pursuit of national goals in educational research.

(b) Development of a coherent coordinated plan of educational research. This could be done by identifying the basic problems of research and making this information available to agencies and institutions. The development of data banks at the national as well as the state level would make the pursuit of research easy and its progress quick. In order that the ideal does not become the enemy of the good, we should look to the resources available and the relevance of the suggested projects to our specific needs. In this task, we ought also to fix priorities and in the right perspective. As educational research has remained a hobby of the few, we have to work towards making it a recognized profession with good returns.

It is also necessary to periodically review the progress of research projects in the context of established national goals and the coordinated educational policy. As a part of this, some investigations on investigations should be undertaken at the national level to find out the quantum of research which has gone into operational use.

The funds for research will have to be ensured because with every budget-cut, social services are hit and among them education is the worst sufferer. In the field of education too, the biggest axe comes on research in view of the pressing demands for developmental work.

Some machinery and procedure has to be developed for disseminating information about the research conducted and the results achieved by them. It is unfortunate that the information about research done in other countries is more easily available in our country than that conducted in our own country.

INDIAN EDUCATIONAL REVIEW

It is not possible for all research to be conducted through established agencies, both at the governmental as well as the private levels. Other outside institutions and individuals with competence to execute this function ought to be identified and this work given to them with a guaranteed financial support.

CONCLUSION

The above is not meant to be a theoretical discussion of educational research, but a practical approach to it, which at the present juncture is more important than ever before, for resolving the crisis that grips our education. Research in education should now take its proper place and assume the responsibilities that it should. □

Research in Education in India

Feasibility of Interdisciplinary Approach

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INTRODUCTION

LATELY, there has been a great emphasis on interdisciplinary research in education. Education, as a discipline, draws heavily upon several basic disciplines like philosophy, psychology, sociology, etc. It is looked to for solutions to various complex societal problems like poverty, racial discard, crime and delinquency, standard of living, and the like. But the educators, many a time, do not have the repertoire of skills necessary for arriving at effective solutions, and in many instances may not even know what caused the problems or what skills are needed to alleviate them. An increasing range of disciplines have become involved in education to help them find solutions. Hence, there is a need for educators to broaden their

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horizons beyond what has been traditionally defined as educational research. Efforts to understand and explain a given phenomenon through a single discipline provide a blinkered view. In other words, a knowledge of several areas is necessary to achieve adequate, well-balanced and long-lasting solutions. This would necessitate a researcher from any discipline to be capable of utilizing knowledge from fields other than his own, or research scholars from related disciplines to coordinate and harmonize different disciplinary approaches (Cook, 1965; Mujib, 1966; Bhola, 1967; Adaval, 1969; Lehmann and Mehrens, 1971; Skager and Weinberg, 1971; Entwistle and Nisbet, 1972; Cook, 1973; and Nair, 1973).

Luski (1958) is of the opinion that the need for interdisciplinary approach is a result of specialization and increase of knowledge. According to him, this approach helps the researchers overcome the danger of professionalized knowledge.

Dutt (1969) emphasizes the need for this approach, because, to her, education is not merely a matter of classrooms, textbooks and organization, but rather an 'integral phase of the cultural aspiration and institutions of people', to study this interaction between education and culture, such an approach would be indispensable.

This approach to problems in education has been recommended time and again by various commissions and committees. The Education Commission (1964-66) recommends that the schools of education develop educational research in a big way in collaboration with other departments.

Examination of these views, expressed by different educationists, committees and commissions leads one to conclude that interdisciplinary approach to research is one of the important approaches to educational research. The present study was undertaken to assess the extent of feasibility of interdisciplinary approach to research in education in India.

To assess the feasibility, it is necessary to ascertain what exactly interdisciplinary approach means. Various definitions have been put forth by different educationists. The following definition explicates the meaning of this approach and is found suitable in the context of the present study :

Research conducted through this approach consists of researcher(s) from one discipline who is (are) capable of utilizing knowledge from fields other than his (their) own and/or researchers from different related disciplines who can intergrate the ideas into a unified whole. This research also implies interaction among disciplines ranging from simple communication of ideas to the mutual fusion of organizing

concepts, methodology, procedures, data and organization of research and education in a fairly large field (OBCD, 1972).

The addition of the prefix 'inter' means that more than one discipline is involved. It also means that the interaction occurs 'among' as well as 'between' disciplines (Luszk, 1958).

It is important to note here that other approaches to research like multidisciplinary approach, pluridisciplinary approach, transdisciplinary approach and pandisciplinary approach do differ from interdisciplinary approach slightly, though, they have been used interchangeably in practice.

METHOD AND PROCEDURE

This is a descriptive survey of the opinions and views expressed by researchers from different faculties of M. S. University of Baroda, and other institutions of higher learning from other parts of the country, on the issue : "To what extent is interdisciplinary approach to research in education feasible in India ?" The study was mostly conducted through semi-structured interviews which generally lasted for about forty minutes. The interviews were held around the following seven broad questions :

1. To what extent can a problem be solved through research ?
2. Through what approach can these problems be solved—unidisciplinary approach or interdisciplinary approach ?
3. How far are the following aspects of interdisciplinary research true ?
 - (a) achieving cross fertilization of ideas ;
 - (b) doing research at higher levels of specialization ;
 - (c) solving the problem of atomization, and
 - (d) investigating large and complex problems.
4. What is the scope of interdisciplinary research related to (a) formulation of hypotheses, (b) division of labour, (c) collection and analyses of data, (d) fusion among disciplines, and (e) efficiency of the solutions arrived at ?
5. How far do the factors of time and finance influence the interdisciplinary research ?
6. What would be the requirements for the success of interdisciplinary approach to research in the universities ?
7. What is the role of the research organizations like UGC, ICSSR,

NCERT and others in the implementation of interdisciplinary research ?

The interviewed sample consisted of 43 teachers—seven professors, 19 readers, and 17 lecturers from seven faculties of the M. S. University of Baroda.

The sample contacted through the opinionnaire consisted of 36 teacher-educators and 24 other teachers from the M. S. University of Baroda, and other institutions of higher learning from other parts of the country. The opinionnaire consisted of 25 statements constructed on a five-point scale—the degree of agreement or disagreement with the statements ranging from 'strongly agree' to 'strongly disagree'. These statements were related to the seven broad questions of research mentioned above.

DISCUSSION

The data collected through interviews and the opinionnaire were analyzed by employing content-analysis technique and chi-square, respectively. In both the cases, the group expressed a positive attitude towards the feasibility of interdisciplinary approach to research in education in India. The broad conclusions arrived at by analyzing these data are given under the seven different questions below :

1. To what extent can a problem be solved through research ?

Research helps to understand and explore the problem. Purely exploratory studies help to investigate the basic concepts and theories underlying a particular phenomenon, while applied research implements the findings of fundamental research and thus provides a model to solve problems.

2. Through what approach—unidisciplinary approach or interdisciplinary approach—can these problems be better solved ?

Fundamental research which includes exploring the basic concepts and formulation of theories need unidisciplinary approach ; problems dealing with the dynamic society and which are to be explained on the basis of different aspects require interdisciplinary approach.

3. How far are the different aspects of interdisciplinary research true ?

The different aspects that tell about the nature of interdisciplinary research are :

(a) *It leads to cross-fertilization of ideas.* This generalization is true to the extent the research workers are sincere and open-minded and they evolve an integrated concept through proper discussion and interaction. Lack of understanding among the researchers and the absence of genuine concern for the problem would hinder the process of cross-fertilization of ideas.

(b) *Interdisciplinary research is useful at the higher levels of specialization.* This would imply real specialization, in the sense, a deep understanding of one particular discipline along with a general knowledge of the related disciplines. The misconception on the part of the researchers that they would lose their identity or dilute their concepts by accepting others' ideas would hamper the success of interdisciplinary research.

(c) *Interdisciplinary research solves the problem of atomization.* As long as interdisciplinary research deals with wide perspectives of a problem, this conclusion holds good. This would mean that interdisciplinary research needs a generalist rather than a specialist, or more common sense than deep specialization.

(d) *Interdisciplinary research offers means of investigating large and complex problems :* This generalization holds good till interdisciplinary research takes care of both the depth and width of the problem. The doubt that the depth of a problem suffers when it is visualized with a broad perspective results in the non-realization of this aspect.

4. What is the scope of interdisciplinary research ?

The scope of the feasibility of this approach can be visualized to be consisting of two aspects, namely, (a) the selection of research workers, and (b) the process of research.

(a) *The selection of research workers :* It is the feeling of many that interdisciplinary approach to research should not be taken up for the sake of innovation, rather, the researcher must have a felt need in its favour. He should take it up when he becomes aware of his inadequacies to handle complex problems. Four situations can be visualized in this process of selection of research workers.

Firstly, it is the case of an educationist facing the problem. In case he is found inadequate in the knowledge of other disciplines, he could consult books or specialists. The specialists' job would be that of books. They share their ideas and the educationist uses them according to the weightage of the discipline.

Secondly, the situation is of the educationist being unable to do research alone. He engages a team of people who are willing for team-research which implies that each one is democratic enough to contribute, accept and appreciate others' ideas and interact with each other. The educationist, in the capacity of coordinator integrates ideas contributed by these specialists in their respective areas. The team workers need not necessarily, have an awareness of interdisciplinary approach. The coordinator satisfies the condition of being an interdisciplinary man.

Thirdly, in the case of educational researches taken up by specialists from other disciplines, a single researcher who has an idea of related disciplines can undertake interdisciplinary research. If the problem is specific and the researcher knows what disciplines can contribute to explain the problem and to what extent, he could consult books rather than specialists. This will avoid personality clashes that can occur among researchers of a team. This does not necessarily mean that the doors to specialists are closed. But this would require an interdisciplinary man which is a rare case.

Fourthly, it is the situation when the specialist from a discipline other than education involves a team by inviting specialists from other disciplines. But he should not go in for specialists blindly. Specialists who have true scholarship and an inclination to do research through interdisciplinary approach satisfy the pre-requisite of an interdisciplinary team. This further implies their openmindedness, critical thinking and scepticism, genuine concern for the problem, a sense of cooperation and cohesiveness, a minimum level of understanding of other disciplines, a thirst for knowledge, and so on.

In the case of researches where the educationist is not the coordinator, the question, 'who should be the coordinator?' comes in. There is a dichotomy of (i) the coordinator being an interdisciplinary man, and (ii) the coordinator being just a specialist, capable of putting the ideas of the team-workers together.

(i) In the case of an interdisciplinary man as the coordinator, it is felt that mere communication does not help in fusion; and blindly accepting and juxtaposing the ideas do not lead to interdisciplinarity. So an interdisciplinary specialist who has an insight into the concepts, methods and procedures of all related disciplines is conceived of. He would build up a conceptual framework to deal with the problem, meet the other researches constantly, and forge their ideas into a unified whole. Thus, in due course, he would transform these members into interdisciplinary specialists by exposing them to related disciplines and would build an interdisciplinary bank.

(ii) In the case of the coordinator, who is just a specialist in a particular discipline, it is perceived that he can develop understanding among researchers and make them contribute their ideas. He would help them see the relation between each discipline and bring about coordination and fusion among researchers. He would interpret the conclusion in the light of the related disciplines and formulate a common line of action. The educationists believing in an interdisciplinary specialist criticize this sort of research as multidisciplinary research.

Nevertheless, the general qualities of any coordinator visualized are : He should be a person whom the group has accepted whole-heartedly and unanimously as one who can successfully carry on the team-work in all its entirety. He should possess leadership qualities, recognize the contribution of each worker and be a responsible and knowledgeable person besides an academician and a good administrator. But it is rare to find such coordinators.

(b) *The process of research* : After the problem is encountered, the first step in the research process would be to decide on the related disciplines and their weightage in the interdisciplinary research. When the objectives of the study are worked out, the dimensions of the problem become clear. An intelligent guess is made on the basis of previous experience of the researchers and the background of the disciplines in this direction. A pilot multidisciplinary study is conducted which throws light on the role and weightage of each related discipline. On this basis, the extraneous factors are deleted and the deficient factors added, and the study is conducted again.

The actual process is also visualized in two ways : one is based on the belief that knowledge has become artificial due to specialization and so one should start looking at the problem taking the global concepts into consideration without compartmentalizing. Once the concepts are clarified and their dimensions fixed, thinking together starts at the planning level itself resulting in fusion. Due to interaction, the hypotheses put forth by different specialists get integrated into a comprehensive hypothesis. Here separate disciplines do not exist and there is no distinct division of labour. This hypothesis is tested by suitable tools and techniques and the results interpreted.

The second is : the problem is encountered and defined in operational terms. The researchers come out with the hypotheses according to their views. The coordinator decides the dimensions of each discipline and allots work to each specialist depending on the contribution of the discipline. The data are collected and analyzed. The uniqueness and the commonalities are found out and the results are interpreted on the basis

of selection of suitable solution to the problem. Thus the fusion is achieved.

A few practical difficulties in the process of conducting this research are envisaged. Firstly, it is that all disciplines are not at the same level of development. This prevents the interpretation of the concepts and procedures of one discipline in the light of the other. Secondly, it is felt that the required specialization to take up interdisciplinary research is lacking among the researchers in India. At present, interdisciplinary approach would be only an escape ground from the rigorous specialization imposed on people. For a research to be successful, one should essentially see that there does not exist a gap between the researcher and the actionist. Thirdly, the feeling on the part of the researchers that they would lose their identity by accepting others' ideas will only slacken the process of interdisciplinary research. Instead they should realize that they would be enriching their knowledge by others' ideas.

5. How far do the factors of time and finance influence the interdisciplinary research ?

Three different kinds of views given below have been expressed towards the factors of time and finance.

Firstly, the question of time and money does not arise, since the researchers have voluntarily agreed to work in an interdisciplinary research. Further, it implies that they are ready to work whole-heartedly and have freedom to spend money and time if they have them at their disposal.

Secondly, instead of many researchers trying to solve the same problem from their own angle, the required money and time could be pooled together for an interdisciplinary research which serves a better purpose and brings meaningful results. Furthermore, it is emphasized that the time and money expended would be proportional to the returns in terms of the efficiency of the solution and a better outcome. It is also felt that the problem of duplication and shortage of equipment can be overcome by having a 'centralized workshop'. This will also avoid the problem of lack of funds which would have been there otherwise.

Thirdly, difficulties like non-suitability of time among researchers from different departments, and non-flexibility in the rigid rules will be a hindrance to interdisciplinary research. 'Decentralization of authorities' in the administrative structure has been suggested as the only solution to this problem.

6. What would be the requirements for the success of interdisciplinary approach to research in the universities ?

It is felt that, to begin with, introduction of rigorous training in the form of formal courses in related disciplines is essential for a student through his college education. This would imply a change in the curricula and the administrative structure. The necessary academic inspiration to the teachers for restructuring the courses and a centralized time-table system are suggested. Along with this, informal methods like seminars, discussions, symposia and extension lectures can be provided to the students to achieve the 'sociology of research'.

This presupposes a few alterations among the staff and the administration of the university. To have good academicians trained in this approach, orientation courses could be given to interested teachers in the methodology of interdisciplinary research and effective means of implementation. With the help of facilities for communication such as newsletters and bulletins, discussions, seminars and talks for teachers can be arranged in a big way. Teachers involved in this research should not be bound by rigid rules, such as, being present in the campus for a required amount of time, recruitment in the department in which he has specialization, etc.

This would further presume the availability of adequate library facilities, a proper teacher-student ratio, physical facilities and expertise. A centralized workshop, equipped adequately with technician(s) is suggested for the use of all the departments. There could be a research advisory team consisting of expertise in different disciplines which helps the researchers in proposing, planning and carrying out research in an interdisciplinary way.

Contrarily, there is a feeling that the mentality of an individual limits the extent of training, and a researcher cannot be trained to be openminded if he is not. This emphasizes the idea that interdisciplinary research is a waste of time, money and energy.

7. What is the role of research organizations like UGC, ICSSR, NCERT in the implementation of interdisciplinary research ?

The views expressed about the role of research organizations in the successful working of interdisciplinary research are more or less similar. It is felt that these organizations would readily agree to such a research provided the problem is chosen in the area that is given the maximum priority, the extent of funds suits their purview and the research is genuine in terms of plan and procedure.

There is another feeling that the problem of convincing these funding bodies in favour of interdisciplinary approach is an academic and a political one. Nevertheless, it has been expressed that the problem is not unsurmountable.

CONCLUSION

Interdisciplinary approach to research in education has been considered an important one since the problems in education are complex. The views expressed by various persons indicate the feasibility of this approach in the Indian context. But the feasibility presupposes certain conditions and requirements, such as (a) true scholarship, openmindedness, and genuine concern for the problem on the part of the researchers, (b) structural change in the administration of the university, like flexibility in the administrative structure, centralized time-table system, centralized workshop and the like, (c) creating expertise to help the researchers take up research through this approach, etc. It was also expressed that the research-sponsoring agencies should have more favourable attitude for funding interdisciplinary projects.

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Environmental Studies in the School Curriculum

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INTRODUCTION

THE ENVIRONMENT has been a source of education, in varying degree, through the ages. The inclusion of environmental studies in the school curriculum, however, is of a very recent origin. This is obviously because of a feeling of environmental deterioration based on a number of experiences and evidences. As Cotton (1972) points out:

One could go on at length quoting from distinguished people who view with alarm the situation our civilization has reached through its treatment of its environment. These people are not saying that the human race is necessarily doomed but that if we do not drastically improve our treatment of the earth then the outlook is bleak.

It is against this background that a greater need is felt today for a widespread awareness for the quality of our life and the issues like population, land use, conservation and pollution affecting environmental quality. Environmental studies as a subject is, therefore, receiving an increasing attention for introduction in the school curriculum. As a subject, it is also considered worthwhile in view of newly emerged educational principle. For example, it integrates the traditional

disciplines and acts as a bridge between science and social studies in particular and with other school subjects in general. It also provides direct experiences and an encounter with the problems which are so real and immediate and at the same time have far-reaching effects. In the new curriculum for the ten-year schooling, environmental studies, as a composed course, has found its place in primary Classes I to V. Can the subject find its place further at the secondary stage? It is with regard to this question that this paper discusses its meaning in wider perspective, various approaches of its dealing during different stages, and its objectives, subject-matter and organization at the secondary level.

THE MEANING

The International Conference on Environmental Education in the School Curriculum, held in cooperation with Unesco and Foresta Institute at Foresta for Ocean and Mountain Studies, Carson City, Nevada, U.S.A., in September 1970, recommended the following definition :

Environmental Education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. Environmental Education also entails practice in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality (Brown and Martin, 1972).

The definition is fairly a comprehensive one and embraces various different approaches. The subject is approached in a variety of ways in many countries emphasizing one dimension or the other. The environment itself is multidimensional and its study in relation to man gives rise to a number of possibilities. Different ways of looking at this subject giving a number of variations have been mentioned by Carson (1973) as under :

- (a) Some would emphasize the natural environment while others would emphasize the man-made environment.
- (b) Some stress the need to understand man's biological and physical environment, others the need to promote a sense of responsibility for the environment.
- (c) Some view environment as a method within an exciting discipline

or a group of discipline, while others see it as the name of a new and developing subject, in its own right and in its essential unity.

The concept of environmental studies as given in *The Curriculum for the Ten-Year School : A Framework* (NCERT, 1975) is that in Classes I and II science and social studies should be covered through environmental studies as a composite course in an integrated manner and in Classes III, IV and V there should be Environmental Studies—I (Science) and Environmental Studies—II (Social Studies).

DIFFERENT STAGES

In simple terms we can express different main approaches as, (a) education *from* or *through* the environment, (b) education *about* the environment, and (c) education *for* the environment, in order to comprehend the whole field of environmental studies. The various ways of looking at environmental studies appear to be complimentary in nature in the whole span of school education from primary stage to secondary level. Education *from* the environment, for example, is a starting point which motivates the learner for further learning about the environment. It is a suitable approach at the primary level where the children are so curious to learn from their environment around them. They should be fully acquainted with their neighbourhood surroundings. The school in all stages, in fact, is expected to make learning real and relevant through interaction with its physical, biological and social surroundings by deriving deep from the countryside and the society. The approach can continue, depending on the nature and the complexity of the environment, in various degrees at various stages of education. Similarly, education *about* the environment takes place at all the stages depending on the complexity of environmental aspects. At the primary and the lower secondary school levels, obviously less complex aspects, like study about local conditions and social studies by visits to galleries, museums, gardens and other local places may be covered. Perry and others (1974) have pointed out that "initially the pupils should visit and study the local area and extend from this to more distant of the world.

At the advanced school level, where the two approaches continue with the more complex environmental aspects, the emphasis is desired to be on education *for* the environment. It is through this approach that the children learn to react to the environment. It is one thing to expose the children to the environment but it is another thing how the children react to the environment and its problems. Baker (1974), talking about environmental studies in secondary schools, points out :

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There is general agreement for the view that any form of environmental studies should be 'for' and not merely 'about' the environment and that it is desirable for all children to be educated to an appreciation of environmental problems.

THE OBJECTIVES

At the secondary school level, where the pupils are comparatively more mature and are capable of understanding complex natural phenomena, analytical thinking to some extent and evaluation in moral and aesthetic sense, the objectives of the environmental studies could be formulated as under :

1. Understanding of economical patterns, interrelationship between the individual, his biophysical system, his cultural and social organization and developing certain concepts like totality of environmental phenomena, the limitations of natural resources for their wise and restrained use, the value of limit to population growth and resources' conservation.
2. Cultivating an attitude of mind towards environmental management so that the students perceive themselves as effective agents and custodians to make a worthwhile contribution in bettering environmental quality.
3. Recognizing the values related to the concepts mentioned above and coming to own decisions about these values so as to develop their own code of conduct.

SUBJECT-MATTER AND ITS ORGANIZATION

Environmental studies is a multidisciplinary integrated subject and there is a very wide spectrum ranging from natural environment from the point of view of biological studies to the matters of sociological concern. A variety of models for the organization of the subject-matter woven around the themes of man, energy, use of land, etc. have been suggested by biologists, geographers, physicists, sociologists, and so on. Some of the models are shown by Carson (1973). Another mode woven around the key idea of 'conflict', based on the conceptual framework by Ward and Dubes in *Only One Earth* (Penguin), is worked out by Merriam (1974). Many more models have appeared in some journals.

related to this subject. The starting point may be energy, man, land or from a number of different subjects, but it must lead to a common understanding of the environment and must illuminate its impact on man and man's impact on it.

The European working conference on environmental conservation education (15-18 Dec., 1973) recommended the basic understanding of : (i) Physical environment constituting planet earth, energy flow, atmosphere, lithosphere, land forms, surface water, ocean; (ii) Ecology constituting general ecology, population, and behaviour of living things; (iii) Human activities constituting social organizations, cultural considerations and customs, and above all, their interrelationships and evaluation. These recommendations were particularly pertaining to secondary education. The details under these topics have been further specified.¹

It is obvious that the subject-matter and its organization involves the integration of many disciplines in order to achieve the desired objectives. In one of the letters to the editor, published in *The Hindustan Times* sometime ago, Mr. E. Mendonza of St. Michael's Grammar School, Delhi, mentioned a very good example to show how knowledge from a number of subjects could be integrated in a more meaningful manner. To quote him :

For example, let us take 'water and its importance in life'. This can be taught thus : sources of water and the best sources for drinking water (Geography, Chemistry and Hygiene); different methods of purification of water (Chemistry and Hygiene); properties of water and its uses (Physics, Chemistry and Botany); city water supply (Civics and Hygiene); hard and soft water (Chemistry); buoyancy and water pressure (Physics), water content in our body (Biology); irrigation and power (Geography and Economics), effects of running water and water as an agent of erosion (Geography and Economics); deposition and formation of alluvial soil (Geography); civilisation cropping up near sources of water (History); rivers for transportation against floods and of dams (Civics, Economics, Geography and History), and so on.

Hence the framework of such study may contain these sorts of contents in an integrated manner :

¹Primary and Secondary School Recommendations from the Zurich Conference. (1972-73). *Environmental Education*, N.A.F.E., Heinmann, pp. 45-51.

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1. Energy, its flow from the sun, man's dependence on the energy captured by primary procedures, production systems, world scale problem of food problem.
2. The landscape, its topography, geology, climatology, man's use of natural environment through agriculture, horticulture, foresting and other forms of land management.
3. The ecological relationship, the principles governing the interaction of the natural processes of land, water and all living things, the variety and maintenance of organisms.
4. Local history and the interaction between past societies and their environment, the present communities, social interaction.
5. Environmental problems and the man, population and pollution, causes and consequences, man's power to deal with them.

The outline of the subject-matter, suggested above, is neither prescriptive nor perfect. No attempt has been made to prepare a comprehensive outline of the subject-matter. The idea is to illustrate the nature and the sorts of items useful from the point of view of integration and understanding of the desirable concepts. The subject-matter must include both the natural and the socio-economic aspects, man's activities on land and his use of the environment, for providing integrated and meaningful studies.

METHODOLOGY

Simply the new content or the subject-matter taught in the old-fashioned manner would not serve the desired objectives. The essence of environmental studies is its methodology. In the words of the working section of Zurich conference

Whichever design is chosen, the pedagogic methods followed in environmental education should require all pupils to be engaged in field work, in first-hand investigation and in open discussion of problems. Teachers should act as partners rather than authorities in the learning process.²

The subject-matter of environmental studies will certainly make more sense when approached in terms of direct first-hand experience by making use of environment, arranging field studies, visits or expeditions,

²*Ibid.*

providing material needed for practical work and reference material like maps, charts, specimens, models and relevant literature. The main thing is to bridge the gulf between indoor and outdoor learning and linking the learning with the wider issues of the environment. Watts (1969) considers direct experience as a necessary concomitant of interrelationship which characterizes environmental studies so conspicuously. According to him :

The experience need not be school organised; it can equally well be daily neighbourhood experience clarified in classroom work. Being essential concepts, interrelationship and direct experience can also be seen as the basic 'heuristic devices' or methods of investigation, around which environmental work may be organised.

Perry and others (1974) have devoted one full chapter in their book, suggesting field studies and the kind of places for outdoor work. The field-work techniques, discussed by them in the other chapter, are also very useful from this point of view. The student, as a member of a group, must use maps, handle equipment, investigate and discover for himself besides being able to use the reference material in library and elsewhere. The direct experience, thus provided, would ensure his active personal involvement and adequate involvement can foster the sense of responsibility which is a cherished goal of environmental studies.

Norton (1974) discusses at length "an active approach to teaching about the environment" wherein he distinguishes three levels of teaching environmental studies—theoretical level, practical level, and active approach. It is the active approach which helps in awakening social consciousness, encourages them to discuss environmental problems, and examine the current environmental issues and participate in making contribution, however small it may be, to the quality of environment.

CONCLUSION

An attempt has been made to explore various aspects of environmental studies, as a subject in the school curriculum in terms of its meaning, objectives, approaches, subject-matter and methodology. This makes a case for introducing environmental studies at the school stage—not only at the primary but at the secondary stage too. Its ultimate aim is the welfare of environment and the welfare of environment is the welfare of humanity as a whole. Environmental studies, when introduced on a

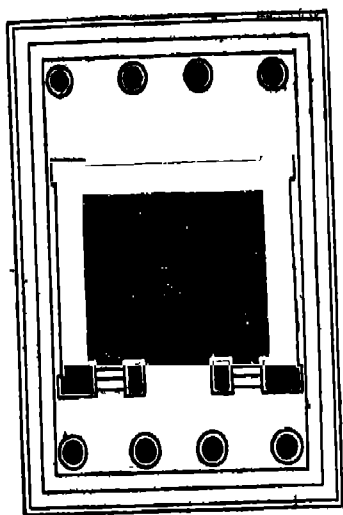
ENVIRONMENTAL STUDIES IN THE SCHOOL CURRICULUM

large-scale in secondary schools, will contribute greatly to developing basic environmental concepts of the masses and fostering in them a basic understanding of the issues and problems calling for intelligent action, decision and manipulation. The utility of environmental studies should not be questioned on the criterion of vocational and university demands. The subject is important for the quality of our life and the quality of our environment, to be loved, cherished and protected.

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□



Ph.D. THESIS ABSTRACT

A Study of the Effect of Some Cognitive and Personality Factors on Attitude Change

KAMLA BHUTANI

INTRODUCTION

To know how attitudes change or can be changed is both a theoretical as well as a practical problem of today. It becomes more necessary during the period of economic, social, scientific, technological and political transformation. Krech, Crutchfield and Ballachey (1962) have described two types of attitude changes: (i) incongruent change in which the direction of change is towards the sign opposite to that of the original attitude, and (ii) congruent change in which this direction is congruent with the sign of the existing attitude.

The present investigation attempts to examine the effects of cognitive consistency, cognitive complexity and personality rigidity on attitude change. Cognitive consistency, complexity and personality rigidity are independent variables and attitude change is the dependent variable. In addition to the main independent variables, the effect of sex, radicalism-conservatism, and extremeness on attitude change have also been studied.

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Cognitive Consistency

McGuire (1960) has defined two specific types of cognitive consistency: (i) logical thinking which is the tendency for a person's beliefs on related issues to be in accord with each other in the pattern required by the rules of formal logic, and (ii) wishful thinking which is the tendency for a person's beliefs on a given issue to be in accord with his desire on that issue.

We find that the attitudes do not occur in splendid isolation but are closely linked with other attitudes in some kind of pattern or structure. Eysenck (1954) has described four different degrees of patterning or organization of attitudes. First, we have opinions which are not important. The second type of opinions are reproducible and form a relatively constant part of an individual's make-up. Thirdly, we have attitudes. At this stage an individual holds not only a particular opinion about some specific issue with a certain degree of stability but also concurrently a large number of other opinions on the same issue which in combination define his attitude towards that issue. Since opinions do not occur in isolation any more and they are closely related with each other we can describe this stage as organization of attitudes. Attitudes themselves are correlated and give rise to super-attitudes or ideologies.

In the present study, the attitude of the subject towards the above four aspects of conservative radical ideology—social, political, economic and religious—has been measured with the help of four attitude scales each consisting of 20 items. Interrelationship of these attitudes has been used as the measure of the consistency of cognitive system.

Cognitive Complexity

A number of different answers have been given to the question how the world is organized and perceived. One significant attempt has been made by Tolman (1948, 1951) and another stems from Lewinian and Gestalt theory. This cognitive organization of the social world vary both between and within individuals. The complexity of a cognitive system depends on the number of elements it contains. This complexity can be judged not in absolute terms but by comparison with the degree of complexity of other systems. In this study a system of constructs which differentiates highly among persons is considered to be cognitively complex and *vice versa*.

Rigidity

Rigidity has been thought of as a general personality trait, as a defence against anxiety, as an intellectual ability, due to cortical pathology, or simply as a perseverating response tendency. The more rigid a personality, the greater is the likelihood of putting up a resistance to change.

Attitude Change

The concept of attitude is perhaps the most widely discussed topic in social psychology. These attitudes are as common and universal as the drives of hunger and thirst and as numerous as the objects towards which they are directed. Since it is a determining tendency, it cannot be observed directly, rather we have to infer it from responses and adjustments. They can be called enduring pre-dispositions to act in a characteristic manner to objects, persons, ideas, values or situations in the social environment and are acquired in social situations.

RATIONALE FOR THE INVESTIGATION

The researcher has tried to answer the following questions :

- (i) Will people with inconsistent cognitive systems change their attitude more easily than people with consistent cognitive system ?
- (ii) Will people with complex cognitive structure change their attitudes more easily than people with simple cognitive structure ?
- (iii) Will flexible people change their attitudes more easily than rigid people ?

We already know that inconsistent cognitive systems are more prone to accept any change which brings harmony in their ideas. Secondly, cognitively complex or comprehensive Ss are more prone to change than cognitively simple or narrow-minded Ss. Besides, rigid persons are not so prone to change than non-rigid or flexible persons. Besides these, a couple of subsidiary issues have been touched upon in the present investigation which are as follows :

- (i) What is the relationship between conservatism-radicalism and the attitude toward mixed marriages ?
- (ii) Is there any effect of sex on persuasibility ?

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- (iii) What is the relationship between extremeness of original attitude and the amount of attitude change brought about by a persuasive communication ?

SAMPLE

The investigator studied with the clustered samples (a form of probability sampling). The subjects were college students. Out of 24 colleges affiliated with Jabalpur University, six colleges (one-fourth) were selected by lot (a method of random sampling). Some of these colleges are quite big so the number of sections of classes were also randomly selected. This sample consisted of both boys and girls of the age-group 17-25 years. The following tables show the total number of subjects chosen by preliminary tryout and for administering the final scales.

Table 1
THE NUMBER OF BOYS AND GIRLS IN THE PRE-TRYOUT SAMPLES

<i>Scales and Tests</i>	<i>Ss</i>	<i>Boys</i>	<i>Girls</i>
Radicalism-Conservatism Scale	300	140	160
Attitude toward Mixed Marriages Scale	50	20	30
Rokeach Narrow-minded Test	20	10	10
Role Construct Repertory Test	20	10	10
Rigidity Scale	15	5	10
Total	405	185	220

Table 2
THE NUMBER OF BOYS AND GIRLS FOR ADMINISTERING THE FINAL SCALES

<i>Scales and Tests</i>	<i>Ss</i>	<i>Boys</i>	<i>Girls</i>
Radicalism-Conservatism Scale	340	160	180
Rokeach Narrow-minded Test/Role Construct Repertory Test	320	144	176
Rigidity Scale	225	110	115
Total	885	414	471

The total number of subjects for pre-tryout and final administration of the test was 1,290.

TOOLS OF MEASUREMENT

For the purpose of measurement, the following tools were used.

(i) *Radicalism-Conservatism Scale.* The R-C scale which measures attitudes toward four important issues, i.e. social, political, religious and economic, was developed upon the eight steps prescribed by Likert and a 120-item questionnaire was prepared. After doing preliminary tryout, 25% highest and 25% lowest Ss' scores were selected for the item-analysis. After calculating the scale value difference for every item, inconsistent items were dropped out. To see whether a specific question differentiates highly between both groups t-value for all the items was calculated. The validity coefficient of R-C scale is 0.67 and the split-half reliability 0.89.

A mixed marriages scale of 30 items was also prepared on the same lines and administered at the time of the final administration of the R-C scale. The split-half reliability coefficient of this scale is 0.95 and the validity coefficient 0.60.

(ii) *Milton Rokeach's Narrow-minded Test for measuring cognitive complexity.* This test was adopted by the investigator for measuring cognitive complexity. The final test was administered to 320 undergraduate and postgraduate students with MM scale. (This sample was different from that of 340 subjects taken for R-C scale). The investigator administered the Rokeach narrow-minded test and obtained definitions as paragraphs indicating interrelationship among ten concepts, viz. Buddhism, capitalism, Christianity, communism, democracy, dictatorship, Hinduism, Islam, Jainism and socialism.

The names of 12 relatives were taken for the repertory test (George A. Kelly, 1955, 1963). These relatives were sorted by the investigator in combination of three and care was taken to see that no three persons appeared together more than once. A total of 10 sorts were obtained. The complexity of the Ss' perception of these persons was measured by counting the number of different perception (NDPIS) he gave in 10 sorts.

(iii) *Rigidity Scale.* The scale for measuring personality rigidity was prepared with statements taken from three reliable and valid rigidity scales of Rehflisch (1958), Coulter (Eysenck, 1954) and Wesley (1953). The scale consists of 50 items having item numbers 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, and 46 from Coulter's scale for rigidity, item numbers 4, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35,

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36, 37, 38, and 50 from Rehfish scale for rigidity and item numbers 39, 40, 41, 42, 43, 44, 45, 47, 48, and 49 from Wesley rigidity scale. This was administered to a sample of 225 subjects along with the MM scale to know their attitude toward mixed marriages. The validity of the scale was not calculated because the items were drawn from valid scales of measuring rigidity. The reliability coefficient is 0.84.

HYPOTHESES

The following hypotheses were formulated for the investigation.

1. An inconsistent cognitive structure is more susceptible to attitude change than consistent attitude structure.
2. Persons with higher level of cognitive complexity are more prone to attitude change in comparison with persons with simple cognitive organization.
3. Narrow-mindedness is associated with low amount of attitude change.
4. Personality rigidity as measured by rigidity questionnaire results in less attitude change.
5. Extreme attitudes are less susceptible to attitude change than neutral attitudes.
6. Radicalism is associated with favourable attitude towards mixed marriages.
7. Females are more prone to change by persuasive messages than males.

ANALYSIS AND RESULTS

One of the objectives of this investigation was to know the effect of cognitive consistency on attitude change. The number of subjects having consistent and inconsistent attitude structure are given below:

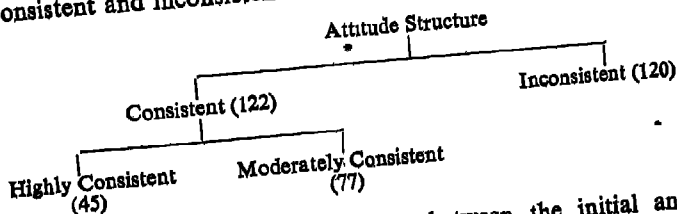


Table 3 shows the mean difference between the initial and final MM scale of attitude structure and frequency of subjects.

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Table 3
THE MEAN DIFFERENCE BETWEEN THE INITIAL AND FINAL MM
SCALES OF Ss HAVING CONSISTENT AND INCONSISTENT
COGNITIVE STRUCTURE

	<i>Cognitive Structure</i>	<i>No. of Ss</i>	<i>Mean Difference between Initial and Final MM Scores</i>
Consistent	Highly Consistent	45	10.47
	Moderately Consistent	77	11.31
Inconsistent		120	24.25

Simple analysis of variance was applied to know the significance of difference between the three groups, viz. highly consistent, moderately consistent and inconsistent attitude structures. The calculated F value was 24.51 which is highly significant at both the levels as with df. 2 and 239 the F value of 3.04 and 4.70 is significant at .05 and .01 levels, respectively. Further, both highly consistent and moderately consistent categories were merged into one category—consistent cognitive structure. The mean difference score for the consistent group was 10.89 and for inconsistent group it was 24.25. The cognitively inconsistent subjects outnumbered their counterparts in changing their attitudes in one direction or the other.

Table 4 shows the significance of difference between the initial and the final scores of the two groups with the t-test.

Table 4
THE NUMBER OF Ss, MEAN DIFFERENCE OF MM SCORES, AND THE
T-VALUE WITH RESPECT TO THEIR COGNITIVE STRUCTURES

<i>Cognitive Structure</i>	<i>No. of Ss.</i>	<i>Mean difference of MM scores</i>	<i>Sed</i>	<i>t-value</i>
Consistent	122	10.89	1.45	9.21
Inconsistent	120	24.25		
Total	242			

The t-value (9.21) is highly significant at both the levels.

The chi-square test was applied to see whether there was any relationship between consistency of attitude structure and sex. The results ($\chi^2=9.397$, $df=1$, $P>.01$) show somewhat superiority of boys in consistency of attitude structure over girls. But regarding the difference between their

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initial and final MM scores of consistent boys and girls the t-value (2.06) is significant only at .05 level and not at .01 level. Similar results were found in case of boys and girls having inconsistent attitude structure (t-value 2.01, significant at .05 level). The difference between initial and final MM scores between boys having consistent and inconsistent cognitive structure as well as girls having these two types of attitude structure was also seen separately. The t-value in case of boys is 6.02 and that in case of girls is 4.52, which are highly significant at both the levels.

Cognitive Complexity

M. Rokeach's Narrow-minded Test and G.A. Kelly's Role Construct Repertory Test were used to measure cognitive complexity. The narrow-minded test consists of 10 concepts—five religious and five political. The Ss were required to define each concept in brief and in the end to write a paragraph stating how these 10 concepts were interrelated. The Ss complexity was judged by the breadth as well as the integrity of concepts. If all concepts were present in the description and were well organized then the cognitive system was considered to be comprehensive, i.e. complex. If the concepts were divided in two or more parts and than interrelated then it was called isolated cognitive organization. If one or more concepts were missing in the integration then it was called a narrow or simple cognitive organization.

Table 5 shows the distribution of Repertory Test scores.

Table 5
THE DISTRIBUTION OF REPERTORY TEST SCORES

Number of constructs	10	9	8	7	6	5	4	3	2	1	Total
Frequency	21	21	32	22	26	27	48	15	12	43	267

The difference between the initial and final scores on MM scale after giving incongruent communication was calculated for both measures separately. For the repertory test, t-test was applied to know the significance of difference between two means of the difference between initial and final MM scores of 122 Ss having complex cognitive organization and 118 Ss having simple cognitive organization. The t-value of 11.12 is highly significant at both the levels because with df, 239 the t-value of 1.97 and 2.60 is significant at .05 and .01 levels respectively.

The investigator calculated contingency correlation between two tests. It came to be 0.41 with SE of 0.061. This obtained contingency correlation was 6.72 times SEC and hence highly significant.

*Relation between Cognitive Complexity
and Sex of Subjects*

To know the relationship between cognitive complexity and sex, the chi-square test was applied. The chi-square value for the frequencies given above was 15.97 which is significantly high at both the levels. Apparently, girls seem to be having more cognitively complex structures than boys.

Personality Rigidity

The subjects were given the rigidity questionnaire with MM scale. The distribution of 202 subjects getting rigidity scores ranging from 21 to 45 are shown in Table 6.

Table 6
THE DISTRIBUTION OF RIGIDITY SCORES

<i>Rigidity Scores</i>	<i>Frequency</i>
21-22	1
23-24	5
25-26	10
27-28	21
29-30	30
31-32	28
33-34	30
35-36	32
37-38	21
39-40	17
41-42	5
43-44	1
45-46	1
Total	202

For this variable also before-after experimental design was used. And for statistical analysis the t-test was used to know the significance of

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difference between the change scores of rigid and non-rigid Ss. As was hypothesized, the rigid persons were more immune to change than the non-rigid Ss because in the rigid Ss there was lack of readiness to be influenced by outside forces than in the non-rigid persons.

One more finding is that the difference between rigid boys and girls in their initial attitude toward mixed marriages was not significant (t -value = 0.52).

Extremeness of Attitude

The attitude scores of 671 subjects toward mixed marriages were divided into two categories—extreme scores and neutral scores. To see the relationship between extremeness of attitude scores and the changing of attitudes, the chi-square test was used. The value of chi-square came to be 88.38, which is highly significant at both the levels. It means that the neutral Ss are more prone to change than the Ss having extreme scores at both the ends. The difference between the initial and final MM scores of 378 neutral subjects and 293 extreme subjects on MM scale was highly significant at both the levels. The t -value in this case was 11.44.

Radicalism-Conservatism

The R-C scale was administered to 242 subjects—42 radicals, 149 neutrals, and 48 conservatives. It was found that there was no difference between radicals and conservatives in the retention of their attitudes. The chi-square value was .007, which is not significant. It is very striking because radicals are supposed to change their attitudes more easily than the conservatives. But later on it was found that radicals were more favourable to mixed marriages and when the investigator wanted them to change their attitudes they did not do it. This proves that radicals can think freely and express their views without any bondage.

Effect of Sex on Persuasiveness

In the investigation the results indicate greater persuasibility of females, though the results are not so significant. Out of total 671 Ss there are 357 girls and 314 boys. The numbers of changed and unchanged Ss are given in Table 7.

Table 7
THE NUMBER OF BOYS AND GIRLS WHO CHANGED OR RETAINED
THEIR ATTITUDES

	<i>Changed</i>	<i>Unchanged</i>	<i>Total</i>
Boys	143	171	314
Girls	191	166	357
Total	334	337	671

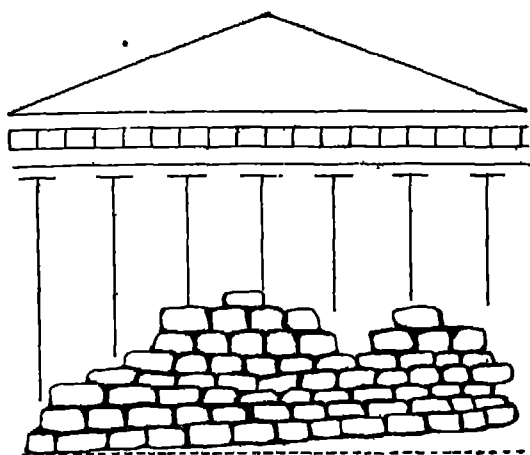
The chi-square test was used for the above frequencies. It came to be 8.928 which is significant at .05 level only. The results showed that girls are more persuasive than boys in every culture.

SIGNIFICANT FINDINGS

The two hypotheses, viz. (a) cognitively consistent subjects are more resistant to change than cognitively inconsistent subjects and (b) subjects having cognitively complex system are more prone to change than those having simple cognitive system were confirmed. The third hypothesis that the rigid persons are more immune to change than non-rigid subjects was also proved true. Another sub-hypothesis which was supported by the results was that subjects having extreme attitudes with regard to MM scale are less prone to change. The last hypothesis which was put to test was that girls are more persuasive than boys and it was supported by the results though the difference was not highly significant. The finding that females are more persuasive than males is true in eastern as well as western culture because our patriarchal society puts extra demands on submissiveness on the part of females. Although the women's liberation movement is taking place but it will take some time to restore equal rights to women in comparison with men.

CONCLUSION

The findings of the present investigation throw light on the effect of cognitive and personality factors upon attitude change. It has also concerned itself with some other important factors like the effect of radicalism-conservatism, extremeness of attitude, and sex on attitude change. However, a number of problems arise from the present study which suggest the need for further research. Research on logical-consistency can be enhanced and explored further with other methods like syllogistic analysis. □



Research Notes

Production and Mediation Deficiency in Children's Free-Recall

A Brief Report

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THE present investigation explores the nature of the production and mediation deficiency hypotheses suggested by Flavell, Beach and Chinsky (1966). This investigation is a replication of a similar study conducted by the author, using a sample of American children (Saraswathi, 1975).

Studies of free-recall with children have generally found an increase with age in the amount of clustering, shown in the recall of categorized lists (Bousfield, Esterson and Whitmarsh, 1953). The increase in clustering has been explained in terms of improved organizational strategies of the older subjects who tend to store and retrieve items in a categorized form. Using the free-recall paradigm in the present study, production deficiency is

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examined by comparing spontaneous categorization with the ability to categorize when requested to do so. Mediation deficiency is tested by seeing whether aids for clustering increase the level of recall in young subjects.

METHOD

Subjects

Thirty children from each of the age-groups 5-6 years, 8-9 years, and 12-13 years were chosen to serve as subjects. These children came primarily from Grades I, IV and IX respectively. Only for the third age-group, namely, 12-13 years, children had to be chosen from Grades VII (seven children), VIII (four children) and IX (nineteen children), as sufficient number of subjects of the appropriate age-group were not available in any one grade. All the children were boys from Rosary School, Baroda. The mean age for the three age-groups was : 6 years; 8 years, 8 months; and 13 years, respectively.

The selected children were assigned randomly to one of the three groups: Control, Experimental Group I (Production) and Experimental Group II (Mediation). Five children from Grade I and one child from Grade IV had to be dropped from the sample, since they were unwilling to cooperate. They were replaced by children of the same age range from the same class.

Materials

Twenty-four black and white line drawings of common items belonging to four conceptual categories were used as materials for the recall task. There were six items in each of the four categories—animals (tiger, lion, elephant, cow, horse, dog, cat), fruits (apple, banana, pineapple, grapes, orange, mango), clothing (shirt, saree, frock, pants, skirt, blouse), and vehicles (car, bus, truck, train, boat, and plane).

Procedure

Each subject was tested individually in a room within the school premises. The items were blocked according to categories for presentation, with the order of the categories and the order of the items within the categories randomized for each level. The pictures were presented one at

a time at an approximately 3-second rate. To avoid differences in labelling, *E* called out the name of the pictures as they were presented. There were four trials, with item presentation followed by a 3-minute period of free recall for the first three trials. The fourth trial consisted of cued recall with no item presentation. Each category was called in a random order and *S* asked to recall the items in each specified category.

For all the three groups (Control, Production and Mediation) the following instructions were given before Trial 1 : I want to see how well you can remember the pictures I am going to show you. I will show you the pictures one by one and call out the name of each picture as I show it. Watch carefully and try to remember as many as you can. After showing all the pictures I will ask you to tell me what all you saw.

The Production Group received the following instructions before Trial 2. Watch the pictures carefully and you will see that the pictures go together in groups. They are pictures of animals, vehicles (things we travel in), clothing (things we wear), and fruits. Try and remember the pictures in each of these groups. The same instruction was repeated in Trial 3 also for the Production Group.

The Mediation Group received the same instructions as the Production Group prior to Trial 2. After Trial 2 recall, however, *E* scanned *S*'s responses and gave a feedback on whether category-clustering had been carried out or not. If *S* had recalled the category items in a mixed order, *S* was told once again that it is easier to remember the pictures in groups of those which go together using examples from *S*'s responses.

To equalize the amount of instructions for the three conditions, *E* repeated the initial instructions to the Control Group before Trials 2 and 3. After each recall, all *S*'s were told : Very good. Now let us try that once again.

For all the three conditions, prior to cued recall, all *S*'s were told: Now I will give you some cues that may help you remember even better. Give me first the names of all (category name, e.g. animals) you saw. Verbal-recall was recorded by *E*.

Analyses

The number of items correctly recalled by each *S* on each trial, excluding repetitions and intrusions were analyzed by means of $3 \times 3 \times 4$ analysis of variance (conditions, age and trials).

The category-clustering scores were computed by applying Bousfield's (1966) measure of clustering. In this measure, the difference between the

obtained and expected (O-e) number of sequential category repetitions is used as an index of clustering; the larger this difference, the greater the clustering or organization in recall. The clustering score was computed for each S on the first three trials. The fourth trial was omitted because clustering was induced by E giving the category cues for recall. The clustering scores were analyzed in a $3 \times 3 \times 3$ (age, conditions, trials) analysis of variance.

RESULTS

Total Item-Recall

The item-recall increased with increasing age [$F(2, 81) = 66.33; P < .001$] and with increasing trials [$F(3, 244) = 283.07; P < .001$]. The conditions' main effect was not statistically significant. The age \times trials interaction was significant [$F(6, 244) = 5.27; P < .01$]. This interaction resulted from the pattern of increase in total recall shown by three age-groups from Trials 1 to 4. While the two older age-groups showed a sharp increase in total recall from Trials 1 to 2 followed by a more decelerated though steady increase in Trial 3 and a near-ceiling performance in Trial 4, the youngest age-group (6 years) did not show a similar pattern of increase. In fact, there is a hard-to-account-for drop in performance in Trial 3, following a sharp increase in recall from Trials 1 to 2.

Table 1
ANOVA—TOTAL RECALL SCORES

Source of Variation	df.	M.S.	F
<i>Between Ss</i>			
A (Age)	2	804.70	63.33
B (Conditions)	2	5.02	.39
AB	4	11.61	.90
Error (a)	21	12.91	
<i>Within Ss</i>			
C (Trials)	3	696.37	283.07
AC	6	12.96	5.27
BC	6	4.54	1.80
ABC	12	1.88	.72
Error (b)	244	2.46	

***P < .001 ;

**P < .01

PRODUCTION AND MEDIATION DEFICIENCY

The Newman-Kuel's mean comparisons revealed the following differences among the means for age levels and trials. The oldest age-group (13 years) recalled significantly more items than the youngest age-group ($P < .01$). The middle age-group also recalled significantly more items than the youngest age-group ($P < .05$). The difference in recall between the 13-year olds and 8-year olds was not significant. (Means : 13-year olds = 20.44; 8-year olds = 18.72; and 6-year olds = 15.35).

For trials, the increase from Trial 1 to Trial 2 was observed to be significant (Means : Trial 1 = 14.24; Trial 2 = 18.56; Trial 3 = 19.09; Trial 4 = 20.78). None of the other differences were significant.

Category-Clustering

Category-clustering increased with increasing age [$F(2,81) = 63.14$; $P < .001$], and with increasing trials [$F(2, 167) = 157.56$; $P < .001$]. The conditions' main effect was not significant. The age \times trials interaction was observed to be significant. This interaction may be explained as follows : For the two older age-groups (13-year olds and 8-years olds) clustering scores increased sharply from Trial 1 to Trial 2 and continued to increase though less rapidly from Trial 2 to Trial 3; while the youngest age-group (6-year olds) showed an increase in clustering from Trial 1 to Trial 2, no increase whatsoever in clustering was observed from Trial 2 to Trial 3. Hence the observed interaction.

Table 2
ANOVA—CLUSTER SCORES

Source of Variation	df.	M.S.	F	
<i>Between Ss</i>				
A (Age)	2	509.55	63.14	***
B (Conditions)	2	1.51	.19	N.S.
AB	4	3.23	.40	N.S.
Error (a)	81	8.07		
<i>Within Ss</i>				
C (Trials)	2	497.90	157.56	***
AC	4	22.78	7.21	**
BC	4	10.69	3.38	
ABC	8	8.72	2.76	
Error (b)	167	3.16		

*** $P < .001$; ** $P < .01$

The Newman-Kuel's test for the significance of differences among means revealed the following :

- (a) There was a significant difference in clustering scores of the two younger age-groups and the oldest age-group in this study (Means: 13-year olds=10.46; 8-year olds=6.47; 6-year olds=5.74). The difference between the clustering scores of the 8-year olds and 6-year olds was, however, not significant.
- (b) There was a significant increase in mean category-clustering with increasing trials. The means for Trials 1, 2 and 3 were 5.49, 8.77 and 9.76, respectively. The difference between the cluster scores of Trial 1 and Trial 2 was significant. The increase from Trial 2 to Trial 3, however, was not significant.

DISCUSSION

The observed deficit in the young children's item-recall and category organization suggest the possibility of both production and mediation deficiency. Evidence for production deficiency comes from both within the age-group and between age-group comparisons. The deficiency in young children's category-clustering was observed both in the overall comparison and in the comparison of the control group's performance alone. The performance of the control group especially shows that young children fail to spontaneously use category-clustering as mediators in free recall. In an earlier study conducted by the author (Saraswathi, 1975) it was observed that mediational instructions increased clustering but not the total item-recall.

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Sociology of Science Education

Problems and Research Perspectives

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SOCIOLOGY studies social institutions. Science is also a social institution in modern times, and so it also comes within the purview of sociology. In fact, so much interest has been generated in this direction that a very specialized field of study entitled 'Sociology of Science' has emerged during recent decades to study various aspects of the relationship between society and science. According to Joseph Ben-David the sociology of science studies the way in which scientific research and diffusion of scientific knowledge are influenced by social conditions, which, in turn, influence social behaviour.

Various sociologists like Robert Merton, Sorokin, Bernard Barber, Walter Hirsch, E.Negal, B.Hessen, Joseph Ben-David, Randall Collins, S.N. Eisensteadt, etc. have enriched this field with their contributions. *The Sociology of Science* edited by Bernard Barber and Walter Hirsch (1963) still remains a classic book of readings in this field, although newer contributions are being added to this field by sociologists and educationists of many countries.

The growth of the field of sociology of education can be divided into two periods, the first one starting from the early 1920s to the end of the 1930s, and the second one starting after the World War II and lasting to date.¹

During 1920-30, the major writing and research interests in this field were: role of science in social change, problem of resistance and suppression, social functions of science, conceptualization of the informal social system of science, and the social history of science and technology in the seventeenth century. The post-War developments in this field have revealed these trends: interactional study of the scientific community, socialization of younger scientists, scientists' interest in philosophical ideas and theories, conceptualization of scientific interaction, influence of class interests, racial origin, political ideology on science, social responsibility of the profession of scientists, institutions of scientific activity, science in totalitarian societies, and very few studies on the social effects of science.

Essentials of the Sociology of Science

1. According to Talcott Parsons, a sociologist, the basic norms of any scientific knowledge are: empirical validity, logical clarity, logical consistency, and generality of the principles involved.

2. German sociologist Max Weber believed that the belief in the value of scientific truth is not derived from nature but it is a product of definite cultures.

3. Robert Merton has demonstrated that there has always been existing a latent and active hostility towards science in many societies which hinders or slows down the pace of development of science in those societies.

4. Scientific research is not conducted in social vacuum.

5. Most institutions demand unqualified faith, but the institution of science makes scepticism a virtue.

6. Dictatorship organizes, centralizes and hence intensifies sources of revolt against science which in a liberal structure remains unorganized, diffuse and often latent.

7. A scientist has to undergo special careeristic stresses. His whole personality is so moulded by his profession that hard work, devotion to duty, fearlessness and sobriety become the very elements of his nature.

¹ *International Social Science Journal*, Unesco, Vol. XXII, 1970; special issue on 'Sociology of Science'.

8. Any scientific achievement is the result of accumulated effort of many scientists. Newton's classic statement is worth remembering: If I have seen farther, it is by standing on the shoulders of giants.

9. No modern scientist believes that he will ever be able to make a grand invention by serendipity pattern, i.e. by an accidental happening or by just a stroke of luck. Systematic and strenuous research work done by him, taking help from his predecessors and contemporaries, only can produce outstanding inventions or findings.

10. It is in the very ethics of the profession of scientific researchers to stand for truth discovered by them, and to be prepared to sacrifice even their lives for the sake of truth. The long social history of science is full of many such inspiring sacrifices made by scientists of conscience and integrity. That nobel tradition continues in most of the countries even today. The respect of independent scientists and university scientists is definitely greater than bureaucratic scientists, working in governmental and semi-governmental agencies.

11. According to Max Weber, "in the field of science only he who is devoted solely to the work at hand has personality." He further holds, "only by strict specialization can the scientific worker become fully conscious, for once and perhaps never again in his life time, that he has achieved something that will endure."

12. The practice of affixing the name of the inventor or discoverer to all or part of what he has found, e.g. Copernician system, is only the most enduring and perhaps the most prestigious kind of recognition institutionalized in science. Anonymous or mediocre research assistants have no place in this scheme of things.

13. According to Edward Shils, "the freedom of publication and discussion is absolutely central to the tradition of science."

14. Plagiarism and fraud are outside the culture of scientists. A scientist is morally bound to give due credit to other scholars from whose works he has benefited.

15. The applicational aspects of science, i.e. technologies of different kinds are of crucial social, cultural, political and economic importance since their basic purpose is to make man's life easy, comfortable and fruitful.

16. Science as an agent of social and cultural change and modernization is very much recognized all over the world.

Sociology of Science Teaching in Schools

In most of our schools there are shortages of labs, tools, materials,

dedicated, well-trained and innovative teachers, and of the continuance of stale courses and *anomie* (normlessness) in the use of science teaching methods. We find many science teachers asking students to read out from science books in classes instead of getting the experiments (even those prescribed in the syllabus and described in the textbooks) actually done by them. The high expectations of our scientists, educationists and leaders usually remain unfulfilled because the science books are written either in difficult English or Sanskritized Hindi which is even more difficult for the students to understand. Many science teachers are frustrated, apathetic, unenthused, and tuition-hunters. They fail to cross the barrier between the cultures—the culture of science and that of humanities and social sciences. There are schools in which science kits, so enthusiastically sent by Unesco or NCERT, remain unopened and unused for years and they just lie in the dingy corners of school libraries.

Science Education under the 10+2 Scheme

The new curriculum for Classes IX and X, developed by the Central Board of Secondary Education, New Delhi, has envisaged a comprehensive course of general education with provisions for work-experience. A minimum essential core of knowledge for promotion of intellectual capabilities has been provided by teaching subjects like languages, mathematics, sciences and social sciences. The terminal behaviour on the part of the students, in so far as science is concerned, is that the student will have a proper understanding of fundamental concepts of basic laws of nature and their operations, and also be able to have the knowledge of the methodology of applying such knowledge to the solving of everyday problems in a scientific manner.

The curriculum-framers have prescribed several topics in three prominent sciences—physics, chemistry, and life sciences. It is for the subject teachers to tell us now as to how far are these courses suited to our social and cultural contexts. Are they psychologically motivated to the students? Are they full of potentialities for the welfare and enlightenment of our masses? Are they too light or too heavy to discourage the students? Are they really modern courses of just old wine in new bottles? Is it possible to apply new science methods in teaching them?

The author finds that the curriculum-planners have paid scanty attention to the socio-cultural context and the proper methodology of teaching science. At Classes IX and X, the most useful methods would have been the biographical method, the observation method, and the experimentation method. The life of a scientist, vividly presented, describing his back-

ground, frustration and achievements, etc. should serve as the most effective medium for communicating knowledge, impressions and values of science. The importance of field-observation, nature study, project and experimentation cannot be overlooked.

What types of teachers are needed for teaching science? What personality patterns and competencies should they have? Aren't they going to be grand preceptors teaching every kind of science without having proper qualifications, aptitude and competencies for them?

Research Needs in Science Education

The Regional College of Education, Ajmer, organized on 22-26 March 1976 a workshop on "Research in Science Education", in which research needs in science and mathematics and sociology of science were discussed by the participants. The consensus of the workshop was that research in science education in our country is still very little, almost primitive. There is no research work in the area of sociology of science education. There are no fundamental studies on the pattern of HPP (Harvard University Project Physics). There are no studies available on the comparative advantages of new physics versus old physics. *The Third Indian Year Book on Education* (NCERT, 1968) and *A Survey of Research in Education* (1974) as well as the review papers submitted by Prof. V. N. Wanchoo, Dr. J. K. Sood, Mr. A. C. Pachaury and Prof. R. P. Singh to the workshop clearly shows that there is very little of research in India on the sociological aspects of science teaching, and whatever research is there on the teaching and curriculum of science teaching in Indian schools is not creative and functional in the socio-cultural context.

It is necessary to think of evolving research topics in a sociological perspective. Factors like rural-urban social groupings, religion, superstitions, traditions, economy, caste, social class, language, occupations, symbols, public cooperation, opposition, expectations, and needs of the rural masses, politics, bureaucracy, etc. should be closely studied in so far as they affect science education in today's schools. Their impact on TV, radio, journals, science comics and fictions, exhibitions, science contests, etc. also deserves to be studied.

The socio-cultural backgrounds, career patterns, motivations, frustration, training, reorientation of science teachers, and the effectiveness and utility of seminars, workshops, etc.—all these are vital research priorities in science education. Research is urgently called for in the personality patterns of students who should take up higher science in their college careers.

A lot of meaningful research is needed on textbooks, equipment improvisation of tools and procedures, and the pupils' interests, achievements, and difficulties in science subjects being taught to them. How much of science knowledge has, in fact, gone into their daily habits and in the daily life of their relatives in their families as a result of classroom instruction, is yet to be investigated.

The cost-benefit analysis of science tools, methods, laboratories, and the value-conflicts of students, teachers and parents are also significant topics for the researchers in science today.



Upgrading the Science Syllabus

An Experimental Study

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SYLLABI in the school subjects may rightly be called the concrete form of the curriculum, which, in turn, is the reflection of some philosophy, advocated by a particular institution, sect or society. Consequently, organization and gradation of the content had been mainly a matter of some set of values, personal experience and adult guess. Modern education which tries to maintain a sort of equilibrium among the different forces (aims) of education, and makes the child as the central theme, enumerates several bases for the same, e.g. needs of the child, his interests, his capabilities, etc. (Robinson, 1934). Needless to say, these bases are again used from casual observations of personal experience and adult guess. While the authority of personal experience and a mature adult guess are worth relying, they cannot be taken as foolproof, and, above all, call for sound rationale and empirical proof. That is why the Kothari Commission

(1966) has emphasized the need of research for improving the school curriculum.

So far as the empirical studies about the curriculum development, particularly about organizing the content, are concerned, NSSE's *Forty-sixth Year Book* (1947) gives quite a good number of them, pertaining to science interests, science readings, and science vocabulary of the students. It, however, adds : "... relatively little has been done with the problem of planning science experiences suited to the needs of the young people of varying maturities". The same view is held by Heiss, Obourn and Hoffman (1950). Dr. Wanchoo (1975) addressing the 48th All India Science Teachers' Association highlighted this point. He said : "What is worse, the main problems confronted in the teaching of science in millions of classrooms in the country have remained uninvestigated so far".

A look into the capabilities of the children for organizing and grading the content becomes more pertinent in the wake of new trend of upgrading the syllabi to cope with the explosion of knowledge. It was this fact that tempted the investigator to see if some portion of the science course-content, which is generally dealt at higher stage, can be taught at lower levels.

Also, the study in hand was taken as a follow-up programme of an earlier study by the author in which the attainment of the three higher secondary classes, viz. IX, X and XI, in the same science fundamentals was studied. The study suggested an intensive programme for teaching the science fundamentals of 'mass, volume and density' at lower level. The suggested programme was taken up at Class VII with a view to see its success.

PURPOSE

In the present study an attempt has been made to evaluate the programme of upgrading the science content in 'mass, volume and density' for Class VII. The attainment of the experimental group (Class VII) on these topics and comparison of the same with the attainment of higher secondary students was taken to be the sole criterion of evaluation. Therefore the purpose of the study may be stated as follows : If the science content in 'mass, volume and density' is upgraded in Class VII, how far and in what way the attainment of these students will differ from the attainment of higher secondary classes, viz. IX, X and XI.

THE SAMPLE

One hundred and fifty-four girl students studying at Banasthali Vidya-pith Higher Secondary School were selected. The experimental group had 70 students of Class VII. The control group had 84 students of the three higher secondary classes who had offered science as an elective subject. Particulars of age and intelligence of the two groups are given below :

Experimental Group			Control Group		
N=70 VII			N=84		
			IX N=35	X N=20	XI N=29
Age	M	13.17	14.70	15.34	16.22
	SD	0.95	1.18	0.78	0.89
Intelligence	M	132.79	123.50	135.55	136.15
	SD	22.30	21.70	24.30	20.90

THE TOOLS

The tools used in this study were Intelligence Test and Science Fundamentals Test (SFT-MVD). The former was Jallota's Group Intelligence Test and was used for selecting the sample. The latter was investigator's own test, used for collecting the attainment of the Ss. The SFT had 66 items with a weightage of maximum 80 scores. The items were objective type and belonged to the categories of multiple choice, one-word answer and short-answer type. The test covered the following seven dimensions :

1. Knowledge of the units of 'mass, volume and density'.
2. Ability to compute orally the value of any variable using the formula $D = \frac{M}{V}$.
3. Interrelationship of the variables of 'mass, volume and density'.
4. Effect of temperature on 'mass, volume and density'.
5. Concept of the variables of 'mass, volume and density'.
6. Skill of taking the reading from graduated cylinder.
7. Functional use of the variables in day-to-day life.

UPGRADING THE SCIENCE SYLLABUS

PROCEDURE

The students of Class VII—the experimental group—had General Science as a regular subject of study in their school curriculum. The topic of 'mass, volume and density' was a part of their General Science syllabus. However, the range was not wide. The content in these topics was extended and upgraded. The emphasis was on fundamentals and not details. No change was made in the content of the controlled group which was composed of higher secondary students studying the elective science syllabus prescribed by the Board of Secondary Education, Rajasthan. Students of experimental group came from three sections. Each section was taught by the investigator. The teaching work took 10 school periods each of 40 minutes' duration. The teaching scheme included eight theory periods and two periods for individual laboratory work. Practice in mathematical computation was given through assignment method. Success of the experiment was judged through the attainment on the SFT which was administered at the end of the experiment.

Mean and SD for the SFT scores were calculated and the significance of mean differences were judged against t-ratio. The experimental group was compared with each class of the controlled group separately. Comparisons were made for the total attainment on the SFT as well as for the attainment on each of its dimension.

RESULTS

The results have been presented in the following Table which shows the values of means, SDs and 't's.

Table
COMPARISON OF EXPERIMENTAL AND EACH CLASS OF THE
CONTROLLED GROUP ON SFT ATTAINMENT

N	Dimensions	VII N=70	IX N=35	X N=20	XI N=29	t-values		
						VII IX	VII X	VII XI
	Total	41.30	36.00	47.50	53.20	2.31*	2.28*	4.72**
	Achievement	10.65	12.90	13.25	13.25			
1.	Knowledge of Units	16.50	11.43	17.00	17.34	5.17**	0.43	0.78
	(Total)	4.72	6.26	4.57	5.27			
	(a) K. of the Unit of	4.43	4.00	4.60	4.72	1.11	0.35	0.69
	Mass	2.15	1.43	1.20	1.10			

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N	Dimensions	VII	IX	X	XI	t-values		
		N=70	N=35	N=20	N=29	VII IX	VII X	VII XI
	(b) K. of the Unit of Density	6.20 2.07	3.80 2.81	6.00 2.19	6.60 1.19	5.13**	0.38	0.68
	(c) K. of the Unit of Density	5.84 2.11	3.70 2.45	5.95 1.91	6.14 2.43	4.79**	0.21	0.59
2.	Ability to Compute the Value of Mass, Volume and Density	4.45 1.75	4.46 2.20	5.35 2.42	6.00 1.82	0.03	1.87	3.13**
3.	Interrelationship of Mass, Volume and Density	5.73 1.94	6.17 2.57	5.50 2.67	8.65 2.23	1.07	0.43	6.49**
4.	Effect of Temperature on Mass, Volume and Density	2.00 1.54	2.54 1.76	3.30 1.96	4.75 2.03	1.66	3.17**	7.35**
5.	Concept of the Variables (Total)	7.12 2.20	7.07 2.17	8.00 2.26	8.90 2.56	0.11 0.19	1.60 3.08**	3.49** 3.27**
	(a) C. of Mass	1.76 1.14	1.80 0.81	2.50 0.86	2.48 0.43			
	(b) C. of Volume	3.39 1.21	3.11 1.08	3.70 0.90	3.76 1.07	1.19	1.07	1.42
	(c) C. of Density	2.04 1.18	2.14 1.23	1.80 0.96	2.69 1.23	0.42	0.85	2.24*
6.	Skill of Taking the Readings from Graduated Cylinder	1.80 1.38	2.06 1.10	2.85 1.05	2.04 1.10	1.00	3.18**	4.33**
7.	Functional Use of the Variables in Day-to-Day Life	3.70 2.45	2.06 1.71	3.15 3.20	3.65 2.15	3.67**	0.83	0.09

*Significant at 0.05 level

**Significant at 0.01 level

(a) Comparison of Classes VII and IX

Five mean differences were found to be significant—one at 0.05 level and four at 0.01 level. All of these significant mean differences were in favour of Class VII students. Therefore, the attainment of the experimental group was significantly higher than the attainment of Class

IX students. The dimensions of the SFT on which the groups differed significantly were : total achievement, knowledge of the units, and functional use of the variables in day-to-day life.

It may also be inferred that the total achievement was mainly contributed by dimensions 1 and 7.

(b) Comparison of Classes VII and X

Four 't' values were significant—one at 0.05 level and three at 0.01 level. And in all the four cases, the mean difference was in favour of Class X students. Therefore, Class X students showed better achievement. The total achievement was the cumulative effect of the dimensions of 'effect of temperature on the variables', 'concept of the variables', and 'skill of taking readings from graduated cylinder'.

Thus, the two groups differed significantly on total achievement and on dimensions 4, 5 and 6. The controlled group showed higher achievement.

Comparison of Classes VII and XI

Out of a total number of 14 t-values, eight were significant, all at 0.01 level. And in all the eight cases, the mean of Class XI students were higher. Here again the total achievement seemed to be the cumulative effect of dimensions 2, 3, 4, 5 and 6. The 'not significant' t-values for two dimensions, viz. 'knowledge of the units of the variables', and functional use of the variables in day-to-day life', indicate that the attainment of the groups on these dimensions was, by and large, alike.

CONCLUSIONS

1. The total attainment of Class VII students was significantly higher than the attainment of Class IX students, and also higher on 'knowledge of the units of 'mass volume and density', and 'functional use of these variables in day-to-day life'.

2. The attainment of Class X students was significantly higher than the attainment of Class VII students on the dimensions of 'effect of temperature, concept of the variables', and 'skill of taking readings from graduated cylinder'.

3. The attainment of Class XI students was significantly higher than the attainment of Class VII students on all dimensions of the SFT except

'knowledge of the units of the variables', and 'functional use of the variables in day-to-day life'.

DISCUSSION

The higher attainment of Classes X and XI students seems quite justified in view of their higher age, higher level of maturity and specialized study of the science subjects. But how to account for the lower attainment of Class IX students. One reason may be that they studied these topics only at an ordinary level in the lower classes, and their exposure to the specialized study of science subjects was only a few months' duration (diversification of courses starts from Class IX in Rajasthan).

There is other way of viewing the whole picture of the experiment. The attainment of the four groups exhibits a curve which originates from Class VII, goes down in Class IX and rises significantly in Class X and XI. The only anomaly lies with Class IX. A probable explanation for it may be that the students of Class IX did not study these topics in lower classes. Otherwise, their attainment too had not been lower than the attainment of Class VII students. In other words, students of the experimental group were benefited from the experiment, so much so, that in some aspects (dimensions 1 and 7) of the SFT their attainment was at par with the attainment of the higher group. Hence, the justification of this upgrading programme.

The study suggests that the science curriculum at lower classes can be upgraded in the sense that some of the topics and experiences which are included and imparted at higher level, can be successfully filtered down to the lower classes. But it requires a lot of research and careful planning, since the present investigation is narrow in scope and has several unstated limitations.

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Relationship of Need-Achievement with Personality Groups

A Study

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INTRODUCTION

A GREAT deal of work has been done to ascertain the relationship of need-achievement with a number of personality variables. Some investigators have tried to relate need-achievement with self-concept, risk-taking in children, independence training, home adjustment, school adjustment, academic attainment and speed of performance. Work has also been done to find the relationship between need-achievement and neuroticism as well as between need-achievement and extraversion. These studies in general suggest that need-achievement is unrelated to extraversion and neuroticism.

Muthaya's (1968) investigation revealed that need-achievement as measured by TAT is unrelated to extraversion and neuroticism. De and

* The investigators are thankful to Dr. (Smt.) Amrit Kaur for her valuable suggestions and kind help in completing this research work.

Khan (1969) investigated that the need-achievement was not related to personality, viz. extraversion and neuroticism. Shantamani and Hafeez (1968) compared the need-achievement of engineering, arts, and commerce students and found a significant difference between these groups of students ($C.R. = 2.13$, $P < 0.5$). They also found a low negative correlation between need-achievement and neuroticism ($r = -.01$). Raphelson's (1957) study revealed a significant negative relationship between anxiety and need-achievement. John (1968) also reported that anxiety and achievement motivation were negatively related to Class VII students.

Odell (1969) investigated the possibility of sex differences of the nine through eleven years old age-level in the relationship between general anxiety and need for achievement in the relationship between general anxiety and need for affiliation. His study revealed that need for achievement did not vary with the level of manifest anxiety. Gupta and Gupta (1970) found that anxiety and achievement motivation were negatively correlated for the groups as a whole. Boys unlike girls have higher achievement motivation and those belonging to the middle socio-economic status have higher achievement motivation than those who come either from upper or lower socio-economic group. Jerrath's (1970) study revealed that the score of male and female subjects did not differ significantly loading on test of need-achievement and measures of personality. The second-order factors of personality factors, i.e. anxiety and extraversion had some loading on it.

The purposes of the present study were :

- (i) To study the differences in need-achievement in relation to sex.
- (ii) To investigate the differences in neuroticism and extraversion in relation to sex.
- (iii) To find out the differences in need-achievement in relation to different personality groups.

HYPOTHESES

- (i) Male postgraduate students will have a higher need-achievement than female postgraduate students.
- (ii) There will be no sex difference with respect to neuroticism and extraversion.
- (iii) Male and female students will be equally distributed in the various personality groups.
- (iv) Subjects belonging to different personality groups will differ in their level of need-achievement.

RELATIONSHIP OF NEED-ACHIEVEMENT WITH PERSONALITY GROUPS

DESIGN AND PROCEDURE

Sample

The sample of the study consisted of 220 male and female postgraduate students of the various science and arts departments of the Punjabi University, Patiala. But out of this sample, 42 Ss were dropped out at the initial stage because they were found out on lie score on EPI as non-serious and hence their response-sheets were cancelled out. The final sample consisted of 178 students out of which 96 were male and 82 were female Ss.

Procedure

For measuring need-achievements of the students, Sentence Completion Test (SCT) developed by Dr. B.N. Mukerjee of Nagpur University and for the measurement of personality traits of extraversion and neuroticism, EPIS (Eysenck, 1964) were administered to the subjects. They were asked to complete these inventories after reading the instruction given on the front page. After completion of these tests by the Ss, each response-sheet was scored with the help of the scoring keys given in their respective manuals.

Results

Table 1 indicates means, SDs and t-ratios for male and female students with respect to need-achievement, neuroticism and extraversion.

Table 1
MEANS, SDS AND T-RATIOS FOR MALE AND FEMALE STUDENTS ON
NEED-ACHIEVEMENT, NEUROTICISM AND EXTRAVERSION

	Need-Achievement		Neuroticism		Extraversion	
	Male	Female	Male	Female	Male	Female
N	96	82	96	82	96	82
M	23.46	24.46	12.30	12.86	13.00	12.52
SD	9.88	9.60	3.68	4.76	4.76	4.56
SEm	1.01	1.06	.31	.10	.25	.21
σ_{dm}		1.47		.71		.70
t-ratios		.69		.88		.86

As Table 1 shows the female students have a slightly higher mean need-achievement than the male students. But statistically no significant difference was found between male and female students with respect to need-achievement ($t=.69$). This table also indicates that the mean scores of male and female Ss on neuroticism are quite close to one another, although the female Ss seem to be slightly more neurotic than the male Ss. The female Ss seem to be a little more widely spreaded than male Ss with reference to neuroticism. The t-ratio obtained by comparing the score on neuroticism of male and female subjects was found to be equal to .88 which is statistically not significant. With regard to extraversion, this table shows that male students have a slightly higher mean score than the female students. The value of t-ratios thus obtained was found to be .86 which is again statistically not significant.

To compare the need-achievement with various personality groups, all the subjects were divided into four personality groups. First group included all those students who were above the mean of total group on neuroticism and above the mean of extraversion ($N+E+$). The second group included all those students who were above the mean of neuroticism and below the mean of extraversion ($N+E-$). The third group included all the students who were below the mean on neuroticism and above the mean on extraversion ($N-E+$). The last group included all the students who were below the mean on both the extraversion and neuroticism ($N-E-$). In this categorization, the subjects who were above the mean were considered high on the variable and those subjects who were below the mean were considered low on the variable under consideration.

Table 2 presents the distribution of male and female subjects with respect to four personality groups, i.e. $N+E+$, $N+E-$, $N-E+$, $N-E-$ and the chi-square value.

Table 2
X² VALUE OF MALE AND FEMALE STUDENTS WITH RESPECT TO
FOUR PERSONALITY GROUPS

	Sex Personality Groups				Total	
	$N+E+$	$N+E-$	$N-E+$	$N-E-$		
Male	24	26	33	12	95	$X^2=4.07$
Female	21	28	18	16	83	$df=3$
Total	45	54	51	28	178	

The value of chi-square was calculated to find out sex difference for four personality groups. The chi-square value thus obtained was found to

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be 4.07, which is statistically not significant ($p < .30$). In other words, no statistically sex difference was found with respect to personality groups.

Table 2 indicates that more male than female Ss were found to be belonging to the group $N+E+$ and $N-E+$ whereas more female subjects were found to be belonging to the group $N+E-$ and $N-E-$.

To find the relationship between need-achievement on one hand and the level of neuroticism and extraversion on the other, two kinds of analyses were done. First a chi-square test was done by categorizing the subjects belonging to the four personality groups into high need-achievement and low need-achievement groups. The second method involved the analysis of variance of the scores on need-achievement of the subjects belonging to the four personality groups.

Table 3 presents the chi-square value of students with high and low need-achievement with respect to four personality groups.

Table 3
X² VALUE OF STUDENTS WITH HIGH AND LOW NEED ACHIEVEMENT
WITH RESPECT TO FOUR PERSONALITY GROUPS

Variable	$N+E+$	$N+E-$	$N-E+$	$N-E-$	Total
High Need-Achievement	19	27	23	16	85
					$X^2=1.35$ $df=3$
Low Need-Achievement	25	27	29	12	93
Total	44	54	52	28	178

Table 3 indicates that there is not much difference in the amount of need-achievement of the students belonging to the four personality groups, as X^2 value was found to be 1.05 which is statistically not significant. This shows that the subjects belonging to different personality groups have more or less the same amount of need-achievement.

Table 4 shows mean and SD of need-achievement scores of the subjects belonging to four personality groups. There is not much difference in the mean need-achievement of the four personality groups.

Table 4
MEAN AND SD OF NEED-ACHIEVEMENT OF FOUR
PERSONALITY GROUPS

	Personality Groups			
	$N+E+$	$N+E-$	$N-E+$	$N-E-$
N	43	54	53	28
Mean	30.79	30.52	27.62	28.53
SD	9.60	9.15	10.40	9.60

Table 5 shows the analysis of variance with respect to need-achievement scores of the four personality groups.

Table 5
ANALYSIS OF VARIANCE WITH RESPECT TO NEED-ACHIEVEMENT
SCORES OF FOUR PERSONALITY GROUPS

<i>Source of Variance</i>	<i>Ss</i>	<i>df</i>	<i>Ms</i>	<i>F-ratio</i>
Ss between	273	3	91.00	.92
Ss within	17077	173	98.7	Not significant
Ss total	17350	176		

As Table 5 indicates the f-ratio for need-achievement of the four personality groups was found to be less than 1 ($F=.92$) which is statistically not significant. In other words, with respect to need-achievement, no difference was found between the subjects belonging to the four personality groups.

DISCUSSION

The results of the present study did not lend support to the prediction that male postgraduate students would have higher need-achievement than female postgraduate students. In the study, the value of t-ratio obtained as a result of comparing the scores of the male and female students with respect to need-achievement was found to be 0.69, which is statistically not significant. Gupta and Gupta (1970), found that boys have higher need-achievement than girls. However, the findings of the present study are in line with the findings of Jerrath (1970) who found no significant sex difference with respect to need-achievement.

The results of the study support one of the predictions that there is no sex difference with respect to neuroticism. The value of t-ratio obtained in comparing the scores of male and female subjects on neuroticism was found to be 0.88, which is statistically not significant. This result implies that male and female subjects do not differ from each other with regard to neuroticism. According to prediction, no sex difference was found with respect to extraversion. In comparing the scores of male and female students on extraversion, the t-ratio was found to be .86, which is statistically not significant. Although no statistically significant sex difference was found with respect to neuroticism as well as extraversion, yet it may

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be pointed out here that on neuroticism, female subjects had a slightly higher mean scores than male subjects whereas on extraversion male subjects had a slightly higher mean scores than the female subjects.

As expected no statistically significant sex difference was found with respect to the number of subjects falling into various personality groups $N+E+$, $N+E-$, $N-E+$, $N-E-$. The chi-square test done to compare the number of male and female subjects falling in the four personality groups did not yield a statistically significant value ($X^2=4.07$). It approached 0.30 level ($p<.30$). The direction of the difference indicating that more male than female subjects fall in the group $N+E+$ and $N-E+$ whereas more female than male subjects fall in the groups of $N+E-$ and $N-E-$.

The present study revealed no correlation between need-achievement and personality groups. The chi-square test was done to find the relationship between need-achievement and personality grouping yielded a value of 1.05, which is statistically not significant.

To find the difference in need-achievement of the subjects belonging to different personality groups, the F-ratio obtained as a result of a analysis of variance was found to be .92, which is statistically not significant. Although the value of F was not statistically significant, the direction of the value was found in favour of $N+E+$. $N+E-$, i.e. the subjects belonging to the groups $N+E+$, and $N+E-$ had comparatively higher need-achievement than the subjects belonging to the other two groups, namely, $N-E+$ and $N-E-$.

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Adjustment between Bright and Average Intermediate Adolescents

A Comparative Study

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INDIA is pacing progressively in the era of social change. With a view to gearing education to the ethos and requirement of the country, the *raison d'être* of the 10+2+3 system is going to supplant the outmoded system. Under this system, the most important stage would be the +2 stage wherefrom two streams, i.e. academic and vocational, would come out. The stratification would be dependent on scholastic achievement which is believed to be mainly dependent on utilization of abilities (adjustment) with average and bright adolescents. This would entail assessment of utilization of abilities on parents, teachers, educationists and

*The data reported here are part of an unpublished doctoral thesis entitled "A Study of Adjustment, Personality Values and Vocational Interests of the Supernormal and Normal Adolescents", submitted to Agra University in 1970.

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psychologists at Class X. Further, in a society which gives high premium to white-collar jobs, the problems of adjustment with both streams would arise. In order to cater to this need, reporting of psychological researches, dealing with adjustment of intermediate adolescents from different psychological angles seems inescapable. An attempt was made to comparatively study the problems of intermediate bright and average adolescents in the areas of adjustment.

METHOD

Subjects

The subjects were 200 intermediate boys (100 bright and 100 average) who were screened from a randomly selected sample of 710 boys from different institutions of Moradabad, Uttar Pradesh, through two intelligence tests (Vernon and Ray Chowdhury, 1958; Ojha, 1968). Each group was further dichotomized with regard to age. Thus half of the subjects in each group were 17 years old and other half were 18 years old.

Bell's Adjustment Inventory (Student-Form) was adapted and standardized (Pandey, 1968). The inventory in its present form has a split-half reliability of .66 upward to .87 and interconsistency validity of .51 upward to .91 (Pandey, 1970). The scores on the inventory indicate toward adjustment problems. The normative survey method of research was followed. The scores of the subjects of the groups was compared through suitable tests of significance and variance. The tentative norms were calculated through PEs.

RESULTS AND DISCUSSIONS

Means and SDs of scores of the groups on four areas of adjustment have been shown in Table 1 for 17-year old boys and in Table 2 for 18-year old boys, respectively. Magnitude of 't' and 'F' tests along with levels of significance have also been given for each field.

Examination of Tables 1 and 2 indicates that both 17-year and 18-year groups of average and bright boys have differed significantly on social field of adjustment ($t=2.381$ $p>.05$; $t=3.23$ $p>.01$). Bright boys have scored higher. Perhaps, this may be associated with inadequate utilization of abilities. No significant difference in any other area is discernible. Variability among the members of the 17-year average group is higher

Table 1
MEANS AND SDs OF 17-YEAR OLD AVERAGE AND BRIGHT BOYS

Fields	Cate- gories	N	Means	SDs	t	p	F	p
Home	A	50	11.72	4.47	1.13	—	1.34	—
	B	50	10.78	3.87				
Health	A	50	5.86	3.20	1.41	—	1.77	—
	B	50	6.64	4.26				
Social	A	50	12.06	4.82	2.38	.05	1.38	—
	B	50	14.18	4.10				
Emotional	A	50	8.38	5.68	0.11	—	1.01	—
	B	50	8.20	5.64				

A—Average ; B—Bright

Table 2
MEANS AND SDs OF 18-YEAR OLD AVERAGE AND BRIGHT BOYS

Fields	Cate- gories	N	Means	SDs	t	p	F	p
Home	A	50	10.60	4.24	.54	NS	2.74	.01
	B	50	10.22	2.58				
Health	A	50	7.98	3.92	1.71	NS	1.24	NS
	B	50	6.70	3.56				
Social	A	50	12.46	4.68	3.23	.01	1.84	.05
	B	50	15.06	3.45				
Emotional	A	50	8.20	6.30	.43	NS	0.00	NS
	B	50	8.74	6.30				

A—Average ; B—Bright

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than 17-year bright group in the area of health and adjustment ($F=1.77$ $p>.05$). In comparison of 18-year bright group, 18-year average group have higher variability in the areas of home and social adjustment ($F=2.74$ $p>.01$; $F=1.84$ $p>.05$).

The data given in Table 3 show that 17 and 18-year groups have differed nowhere. Perhaps, the age of 17 and 18 contribute almost similarly.

Table 3
POOLED MEANS AND SDs OF 17 AND 18-YEAR OLD BOYS

Fields	Cate- gories	N	Means	SDs	p		F	p
Home	A	100	11.25	4.17	1.11	NS	1.49	NS
	B	100	10.41	3.41				
Health	A	100	6.25	3.73	1.45	NS	1.01	NS
	B	100	7.34	3.74				
Social	A	100	13.12	4.46	1.34	NS	1.21	NS
	B	100	14.26	4.07				
Emotional	A	100	8.29	5.66	.15	NS	1.24	NS
	B	100	8.47	6.30				

A—17 years old ; B—18 years old

The data in Tables 4 and 5 show that a sizeable number of boys in both groups require guidance.

Table 4
COMPARATIVE NUMBER OF BRIGHT AND AVERAGE
17-YEAR BOYS REQUIRING GUIDANCE

Fields	No. of Average Boys	No. of Bright Boys
Home	8	10
Health	8	8
Social	12	9
Emotional	13	10

Table 5
COMPARATIVE NUMBER OF AVERAGE AND BRIGHT
18-YEAR BOYS REQUIRING GUIDANCE

<i>Fields</i>	<i>No. of Average Boys</i>	<i>No. of Bright Boys</i>
Home	6	14
Health	10	11
Social	21	10
Emotional	16	12

CONCLUSION

On the basis of results of this study, it can be concluded that the intellectually bright intermediate boys have more problems than the average intermediate boys in the area of social adjustment. A sizeable number of bright and average boys require guidance.

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Political Psychology

A New Field

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INTRODUCTION

THE WORKSHOP has first to decide about the time that it proposes to devote to teaching and to research in psychology—equal for both, or more for teaching and less for research, or vice versa. It may be remembered in this connection that a teacher is under a contract to teach, and the heads of departments are under an obligation to organize teaching. The sanctions for teaching are continuing and direct; those for research are fitful and indirect in the sense that they may be used at the time of selection and/or promotion ('promotion' here includes advancement in the profession and not only in one's institution). For our part, we shall be discussing mostly teaching and incidentally research.

In regard to teaching we may have to do some rethinking about the goals of teaching at the undergraduate as well as postgraduate stages. There is at least one factor hitherto ignored explicitly, but now demanding attention while formulating the goals of teaching (and research as well), namely, the insistence on commitment on the part of the intellectual, and the reorientation of the teaching (and research) programme in the direction of development; witness the determined effort to involve intellectuals in commitment; and organization of the programme of the Indian Science Congress around a 'theme'.

If we continue to accept that the goal of postgraduate teaching is to give the student some degree of specialization in a chosen field (either for the purpose of research or service), it is definitely advantageous to provide

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for the teaching of emerging fields of research and/or activity to our students. Some steps have already been taken in this direction: several universities provide for courses in engineering psychology, psycholinguistics, mathematical psychology, and organizational psychology. Environmental psychology, despite the space age in which we live, and the problem of pollution that we face, has not yet acquired a place in our curricula. Political psychology is not even mooted for inclusion in our curricula, even though politics is too much with us. The purpose of this note is to make a plea for the study of political psychology, to indicate its present content and status and to visualize its syllabus.

ARTICULATIONS

If we take psychology to be the study of the soul, the earliest political psychologist is obviously Plato with his threefold division of the soul into reason, spirit and appetite, the division of society in guardians, warriors and artisans according to the part of the soul which dominates, and the entrusting of the rulership of the state to those in whom reason predominates (i.e. philosopher-kings). If we take psychology to be the study of human nature then we find several who qualify as political psychologists, notably Graham Wallace with his *Human Nature in Politics*. If we, however, deny to Plato or Graham Wallace the title of political psychologists because the soul or human nature is not the subject-matter of psychology or on the ground of their being pre-scientific, then among modern psychologists we can pick up Murchison (1929) as the pioneer political psychologist. His book may be taken to be the first book on political psychology, despite its being called social psychology. Murchison seeks the basis of political life not in such hypothetical factors in human nature as social instincts, but rather in the differences in abilities and opportunities of individuals. The social behaviour patterns discussed by him centre around birth control, control of labour unions of others, international relations, community justice and human rights. Some of the behaviour patterns discussed by him are clear examples of political behaviour.

Harold D. Lasswell articulated an aspect of psychology different from the one blazed out by Murchison. In his political writings (*Psychopathology and Politics, Politics : Who Gets What, When, How* and *Democratic Character*) Lasswell applies dynamic psychology to the motivations of political leadership; to the analysis of power and manipulations by ruling elites and counter elites; and the relationship of personality to democracy.

Eysenck (1954) investigated in depth the relationship between perso-

nality and politics. He began by investigating political attitudes because according to him all social and political actions are mediated by attitudes, and attitudes show a considerable degree of organization or structure. Upon analysis, the structure of political attitudes revealed two dimensions: radicalism-conservatism (R-factor), and tough-mindedness-tender-mindedness (T-factor). These two factors he holds account for diverse political parties: Fascists are tough-minded and conservative; Communists are tough-minded but radical. The R-factor, according to his investigations, is a major dimension of social attitudes. T-factor is a projection on social attitudes of certain personality traits. Tough-mindedness is related to extraversion; tender-mindedness to introversion. Tough-mindedness is also related to rigidity, intolerance of ambiguity, narrow-mindedness, and mental concreteness.

The research on American presidential elections by Campbell, *et al.* articulated political psychology in an altogether different direction. While the studies of American presidential elections initiated by Lazarsfeld, *et al.* provided the model for work of Campbell, *et al.* the studies of the former were sociological and of the latter social-psychological, with a bias in favour of clinical questions. The Michigan studies of electoral behaviour were so influential, that to many the study of political behaviour is almost coeval with the study of voting behaviour. Even if it is not taken to be coeval, it is singled out for discussion under the heading of political behaviour (Sears, 1969).

STATUS AND FIELD

Political psychology has come of age. From its modest beginnings in 1929, it can boast today of possessing an extensive area of substantive research problems, a distinctive network of concepts, and a wide-ranging set of tools and techniques. An idea of its coverage can be had from the list of headings in *Psychological Abstracts*, carrying the adjective 'political'. Beginning with 1973, the *Abstracts* lists the following headings to embrace politics:

Political anarchy	Political issues
Political assassination	Political nationalism
Political attitudes	Political parties
Political campaigns	Political processes
Political conservatism	Political radicalism
Political candidates	Political revolution
Political elections	Voting behaviour

The second edition of *Handbook of Social Psychology* carries a contribution entitled "Political Behaviour" by Sears (1954). It is not called political psychology because it is limited to only one of the political processes—electoral behaviour. According to Lane (1963) political behaviour comprises six political processes : electoral and public opinion, legislative, administrative, judicial and legal, international, and integrative. Sears accepts the view of Lane.

The *Encyclopedia of Psychology*¹ lists political psychology as one of the headings, and carries a substantial contribution under the headings by W. von Baeyer-Katte. The contribution mentions the heartening fact that three serials deal with special questions in the field of political psychology. They are : *Yearbook of Political Behaviour Research*, edited by H. Eulau (started in 1961); *Politische Psychologie*, edited by W. Jakobson (started in 1963), and *Studies in Behavioral Political Science*, edited by Presthus (started in 1969).

Knutson has edited a handbook², which is a collection of 16 papers representing the work of psychologists, political scientists, sociologists, and anthropologists in the area of political psychology. The topics covered include methodology (e.g. psychobiology), psychological constructs (e.g. political attitudes), socialization, leadership and aggression.

Stone (1974) has produced an introduction to the study of political behaviour and participation, personality and motivational factors in socialization, and forms of political action. His topics include politics and the search for community, learning of political attitudes, machiavellian, authoritarian, and democratic personality dispositions, changing political attitudes, and the nature of leadership and ambition.

It is a pity that no textbook of political psychology is available. But one will be produced if the field receives course status.

METHODS

The methods of political psychology are as diverse as those of social psychology and behavioural political science. The favourite method for election studies has been survey. The investigation of personality has been based on tests, both projective and psychometric. The study of political attitudes has involved attitude scales, including the semantic differential technique. The analysis of political propaganda has been based on the

¹H. J. Eysenck, W. Arnold, R. Melli (Eds.), *Encyclopedia of Psychology* (3 vols.), London : Search Press, 1972

²Jeanne N. Knutson, *Handbook of Political Psychology*, San Francisco, Calif : Jossey-Bass, pp. xvi+542, 1973

familiar technique of content analysis. For the study of international relations, computer simulation has been a favourite technique. Experimental research on political behaviour has been attempted only on occasions. It is to be hoped that those occasions will become more frequent (Sears, 1969, p. 316).

W. von Baeyer-Katte (op. cit.) has defined political psychology "as the study of the personal aspect of political processes." According to him, the methods of study are five : (i) Research into techniques—emotional means of exercising influence, forms of indoctrination, and rules for cognitive learning processes and socialization as well as processes for reaching political decisions. (ii) Understanding gives uniformities of political behaviours which occur in spite of or because of motivational homogeneity and heterogeneity as is the case in studies of elections and electoral behaviour. (iii) Interpretations, especially neuropsychanalytical, monobiological or typological aspects of political elites, basic personalities of exponents of political systems. For the most part these take the form of starting-point research with anti-democratic syndromes like authoritarian personality. (iv) Enlightenment, i.e. making known the aspects mentioned under (i) to (iii) to participants in political processes. (v) As an applied science, political psychology considers aids to orientation in the instrumental political use of knowledge. It may be noted that Baeyer-Katte's use of the term 'method' is rather unconventional in the English-speaking world.

SUGGESTED RESEARCH

Of the six political processes, attention has been largely confined to electoral and public opinion processes ; "peace researchers" have given some attention to international process ; the legislative, administrative, judicial and legal processes have been largely neglected ; the integrative process clamours for research.

At the theoretical level, political psychology is in need of greater unification. As an interdisciplinary field, further integration of the concepts drawn from the contributing disciplines is a desideratum.

While there have been some studies of voting behaviour in our country, their net results have not been consolidated. There are many aspects of voting behaviour about which no studies have been made in our country. Our political scientists are fed up with election studies ; not such students of psychology who got only limited opportunities to use elections for furthering psychology.

There has been just one study of political propaganda. Many of the

generalizations about the efficacy of the mass media are in need of being checked in a society possessed of huge illiteracy.

Experimental studies of political behaviour have to be encouraged.

Psychological studies of political leaders can be counted on finger tips. We have produced only a psychological approach to Gandhi's leadership; a study of Gandhi's personality had to be produced by Erikson. What about other national leaders for whom the data are available? Why concentrate only on national leaders? Why not study leaders who are available for empirical investigation, i.e. who are living? Surely some among them can be persuaded to cooperate.

What is true of leaders is more true of political parties. There are SD studies of meaning of the political parties, but they have to be added up. There are investigations of authoritarians among various political parties; these are rather exploratory rather than conclusive. What about using the newer concept of Machiavellianism in the land of Chanakya?

Political socialization is a major field of interest for us. While the process of political socialization has been studied cross-culturally in several countries, we have no theoretically and empirically sound studies of the process in our country.

SUGGESTED SYLLABUS

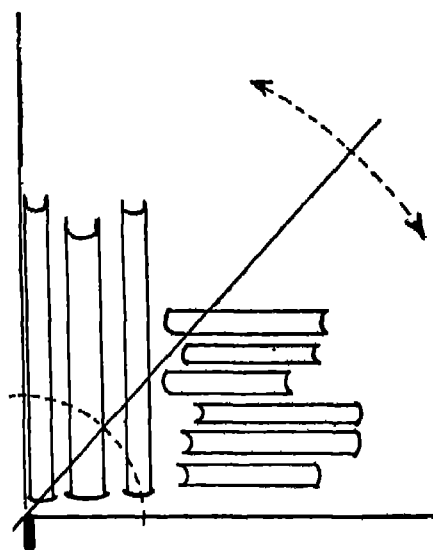
1. Landmarks in the growth of political psychology
2. Basic concepts and definitions
3. Political socialization
4. Political leadership
5. Political parties
6. Political campaigning
7. Political attitudes
8. Voting behaviour
9. National integration
10. International understanding and peace

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Book Reviews

Muslims in Free India

Moin Shakir, Kalamkar Prakashan
New Delhi, 1972, pp. x+156

THE PARTITION of the Indian subcontinent opened new vistas for scholars to study the continually changing perspectives of the Indian Muslims. But few have approached the subject with the diligence and painstaking concern for historical variety which mark Dr. Moin Shakir's study. The book—an extension of the author's previous book *Khilafat to Partition*—focuses on the political and emotional attitudes and postures cultivated by the Indian Muslims during the 23 years (1947-70).

The author presents a comparative and sociological study of secularism in the Indian context. He finds that the partition of India gave the Muslims nothing but "insecurity, frustration and uncertainty" and it was only after the independence that the Muslim elite—the politicians as well as the ulama—for the first time realized the blunder they had committed in the form of the two-nation theory. Dr. Shakir is right in declaring that from every point of view the partition proved to be "a clumsy device

which settled nothing and satisfied none". It should, however, be added here that there was a large majority of the Muslims consisting of working-class people and landless labourers who were extremely disillusioned and who had to face the real burnt of the partition. No doubt there were the elites, the moneyed and the status-conscious people who might have got some satisfaction. The partition, however, had a positive effect on the Muslims that they tried to mould themselves to the changed realities, the politics remained no longer religion-oriented and the separatism lost its validity to fit into the democratic, non-communal set-up. Though the response to the changed realities was not satisfactory.

Had there been no partition the Muslims would not have been divided into three parts and there would have been no reason for them to feel "de-privileged and second-class citizens". Their participation in the democratic processes of the country would have been enthusiastic. There would have been no frustration, disillusionment, withdrawal and isolation on the part of the Muslims.

Critically examining the role of communal parties, Dr. Shakir calls the communal violence as the "part of British legacy in India, who divided the country and handed it over to us to rule". But it was not entirely the responsibility of the British. The Indian leaders did not make concerted efforts to foster real understanding between the members of the two communities. Though in this direction the role of Pandit Nehru cannot be underestimated.

The author analyses the roles played by the two communities and various agencies at the time of communal riots in the country. Dr. Shakir would have us believe that the Muslims conveniently ignored the advice of Maulana Azad for renouncing the religious organizations for political purposes and joining the secular parties which would have ended separatism and communalism, and provide many opportunities of influencing the political life of the country. There were several reasons for this hesitation. The Muslims did not cherish the idea of breaking up of religious identity which they had never done in the past. The Muslim ulama wanted the common Muslims to accept Islam as the basis of their politics. Objectively analyzing the role of the ulama and the religious parties Dr. Shakir highlights the parts played by them in the post-partition set-up. On the one hand, secularism demands the separation of religion from political life of the people. On the other they are told that to remove their backwardness they are to draw upon the Quran in the solution of day-to-day political and social problems. This was the actual conflict which they had been facing in their day-to-day life. There were two clear-cut streams among the Muslims: one going towards secularism and the other going

towards orthodox religious leaning. But for many of them this going to religion provided a convenient solution to their problems. But in Dr. Shakir's opinion the only solution to all the problems is that the Muslims should have faith in the secular democracy which is the expression of the best human values and common citizenship.

To uproot communalism from India an effort should be made in the sphere of historical interpretation and history writing. Instead of serving "contemporary ideologies", a more objective interpretation of history with greater emphasis on the socio-economic aspects of the period under study should be popularized. If a contemporary ideology has to be served then it should be the ideology of a "composite national heritage", rather than the glorification of one community at the expense of the other. The propagation which is "community-oriented" should be avoided. Dr. Shakir puts a responsibility on the majority community as well. He asks the political parties not to look upon Muslims "more as packets of votes than as associates in political work". They should develop mass contact among minorities and try to bring them into political action. Otherwise, the Muslims and other minorities will remain hanging as loose ends. He rightly warns that the opportunistic attitudes of the political parties is not going to pay even to them in the long run.

Many of the liberal Muslims have been advocating a change in Muslim Personal Law. They want that, "in a secular state like India which permitted every citizen to profess his faith, social reform legislation, such as a ban on polygamy should apply to all citizens regardless of creed or community . . . A line must be drawn between the religious and secular aspects of Muslim Personal Law . . ." But these arguments are not acceptable to the orthodox Muslims who consider Personal Law as part of their religion and who are afraid of the loss of cultural and religious identity if any change is made in the Personal Law. Though it should also be noted that amendments in the Muslim Personal Law have been accepted in many of the Muslim countries. Dr. Shakir puts forward a solution and that is to remove the way of the orthodox Muslim leadership over the common Muslims.

The Muslims have no national leader though every Muslim intellectual related to a Muslim political or religious organization claims to be the only representative of the Muslims. Again, they have expressed many differences with the present religious and political elites; they have advocated many grievances of the Muslims but they have failed to suggest any fresh ideas or solutions. To them the Muslims are a sophisticated urban community. They forget that the majority of them live in the rural areas and in the same social and economic conditions as their Hindu brethren. But they seem to have no interest in them.

Dr. Shakir's remark that the Muslim leaders are not interested in the problems or in the well-being of the common Muslims but they just want to speak in the name of the Muslims only to hold their position seems to be justified. Here it is important to note that the Muslims are not a homogeneous well-knit and consolidated community but it is divided into sub-communities on the question of ideology, sectarian religious rites and social customs. The leaders of these sub-communities are, however, interested more in looking after the well-being of their own sub-community.

One may differ with what Dr. Shakir has concluded but on the whole it is an important and much-needed work which touches almost every aspect of the Muslim life in India. One would wish that the author had put forward such concrete suggestions as would go a long way in changing the basic structure of the society—both from social and economic point of view.

QAMAR UDDIN □

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Education in Andhra Pradesh

M. V. Raja Gopal, Telugu Vidyarthi Publications,
Machilipatnam, Andhra Pradesh, pp. xvi+123, Price : Rs. 10.00

THE BOOK under review is neither a textbook nor a research monograph. It falls in-between the two categories. The author makes a preliminary attempt to discuss the practical problems faced by the educational authorities in Andhra Pradesh, and presents omnibus suggestions for several problems.

The book is divided into eight chapters preceded by a foreword by K. R. Srinivasa Iyengar, and a background note of the work by the author in the Preface. In the first chapter the salient features and the main weaknesses of the educational system in Andhra Pradesh are given, thereby introducing the reader to the educational system in the state. In the second chapter, several problems that we face in primary education are discussed: the problem of curriculum, inadequacy of facilities, uneconomic schools (measured in size, and the distance from school to school), the school pattern, stagnation and wastage, etc. The section on adult

literacy programmes is informative. The third chapter is devoted to a discussion of the same problems with respect to secondary education. Another important problem which formed a major part in this chapter is vocationalization. Chapter Four contains omnibus suggestions for the betterment of standards in schools. The author argued for the improvement and dynamism in the quality of teacher education for "investment in teacher education can yield very rich dividends because the financial resources required are smaller when measured against resulting improvements in the education of millions". His other suggestions refer to the reforms in curricula, methods of teaching, guidance and evaluation, and supervision. The discussion in Chapter Five on 'equalization of educational opportunity' is short and not comprehensive, even though the author considered inequality by region, race, and sex. The author suggests several measures towards equalization of part-time courses, correspondence courses, etc. He argues for 'universalization of a common school system of public education'. There is a lengthy presentation in Chapter Six of the administrative network of schools and colleges. He argues for planning from below taking the 'educational district' as a micro unit, then planning by region, and then by the state. Chapter Seven consists of several suggestions for the improvement in the quality of higher education. But some suggestions with regard to teaching methods are highly expensive like use of television, tape-recorder, etc. Most other suggestions are not new, and some have had been implemented long back. They are only to be intensified. Last chapter discusses the sources of raising the financial resources for education by raising educational cess, and surcharge on educational tax, etc. The author also discusses the distribution of the financial burden between the Centre and the State.

On the whole, the book is interesting and useful to all those who are interested in education in Andhra Pradesh. The author claims that Andhra Pradesh being "a representative and progressive state of the Indian Union, presents in its patterns, problems and possibilities, a microcosm of the contemporary Indian situation in education". This is not true. The author also claims that the work is a private attempt in the direction of long-term perspective planning in education pointing out the general direction in which development in 'real' term such as teachers, materials, etc. has to proceed. Again, this is not true. Perhaps this is the ambition of the author which he did not fulfil in this book.

Some sections of the book are purely informative, and some sections present historical account of the emergence of several committees, etc. These are some of the less interesting features of the book. Some of the suggestions the author made deserve some more discussion. As a result they appeared to be hasty suggestions such as suggestions with respect to

external examinations, particularly evaluation of doctoral dissertations, and with respect to renewal of university degrees after a minimum period. But for these few weaknesses, *Education in Andhra Pradesh* is a very useful and interesting book with inter-district and inter-state comparisons, wherever necessary.

JANDHYALA B. G. TILAK □



Education on the Move

Unesco, Paris (First Edn.),
Vidya Mandal, Delhi (Indian Edition), 1975, pp. xi+307

EDUCATION ON THE MOVE is a compilation of extracts from the background papers prepared for *Learning To Be : Education for Today and Tomorrow*. The book under review is a rich stock of the foundational information on which the superstructure of futurology of education is to be built up by the International Commission on the Development of Education. The book contains extracts from about 80 documents collected for the purpose, the full-text of which cannot possibly be presented in a single volume. However, the richness and variety of thought expressed through the extracts will speak volumes about the global fund of knowledge, and the practice and innovations that have taken place in the educational world over the recent years. Obviously, the centre of gravity of this volume is the concept of change, the basis of success development in life.

The work has been divided into two parts : (i) Putting Education to the Test, and (ii) The Time of Innovation. The first part comprises eight chapters while the second part contains seven chapters. A list of the documents prepared for the Commission is given in Appendix A. The first section of the volume examines the gaps existing in the present systems of education the world over, particularly in relation to the demands made

by the fast-developing concept of modernization, mechanization and industrialization, etc. The challenge of mass media and the life-style of the modern man are also making their inroads on the authority of the traditional systems of education, thus demanding a sort of reshaping in education—the closed elitist formal system yielding place to the open, out-of-school or non-formal and life-long pattern of mass education—so as to help it adapt to the realities of life.

This being the major thesis of the work, a variety of efforts and suggestions have been made to arrive at this end. Education needs to be related to economic growth and productivity, variety of human and material resources, employment and labour market, and industrialization, democratization and generation gap, technology and tradition, scientific and polyvalent training and so on, which may help educate man for a complete living. Part I of the book ends with a note on the need and importance of self-learning, and natural and international cooperation in building up the new strategies of education.

Part II describes the why and how of innovations that have taken place to make education co-terminus with life in different parts of the world. These, perhaps, present a kind of practical alternatives for bringing education closer to the life and working out viable policies for educational innovations. The experiences and experiments included in Part II possess a universal carry-over effect and could be replicated by different nations to achieve the desirable goals and priorities of their education. As mentioned in the book, the Chinese educational reform, the Indian intensive educational district development projects and Aurobindo's system of national education, self-government in education in Yugoslavia, the German *Gesamtschulen*, the eleven models of teacher training, 'Sesame Street' for pre-school children, Cuba's parallel system and workshop schools, computer and technology education in the USA, and a host of other experiments could serve as important models for educational development in the modern age.

It is models like these plus on-the-spot studies of situations in different countries and personal consultation with the experts that enabled the International Commission on the Development of Education to come out with a sort of universal model of education, to suit the needs of the developing countries. But for the background material made available to the Commission, the shape of things would have been completely different. Read together with *Learning To Be*, this book assumes much greater importance for those concerned with planning and designing the educational effort in any part of the world.

It is as a consequence of these reports that the concept of life-long

education encompassing the world of work and life has been gradually succeeding in catching the imagination of experts and the laymen alike. The richness of the innovative experiments contained here does justify the title of this volume which is rightly named *Education on the Move*. In that context, education has always to be a constant force of change-in-itself in order to be able to match itself with the changes taking place in society on one count or the other. The literature here, therefore, presents a vast panorama of educational environment that is undergoing changes the world over.

The book suggests many areas for further research, including the whole range of topics from formal to non-formal schooling, from traditional to innovative teaching, from liberal to professional education, from the individualized to group education, from self-learning to technological mass learning, from education to productivity, from innovations to learning strategies, from life-long education to the education of complete man, from incidental to de-institutionalized education, from pre-school to adult, university and professional education, from preservice to inservice education, from local to national as well as international role in education, from schooling to teaching profession, and so on. These could be spelt out in minor details relevant to the specific research project undertaken at individual as well as institutional levels. Thus the creditable work done in the printing of this so-called background material seeks to serve the cause of education in more than one ways. On the whole, the volume has its own intrinsic value to help planning and research in education at different levels. A 'must' for libraries of educational as well as research institutions.

D. N. KHOSLA □